JESS BENHABIB
MARK M. SPIEGEL

Moderate Inflation and the Deflation–Depression Link

Recent research has concluded that the historical evidence only provides weak support for the contention that deflation episodes are harmful to economic growth. In this paper, we revisit this relationship by allowing for inflation and growth to have a nonlinear specification dependent on inflation levels. In particular, we allow for the possibility that high inflation is negatively correlated with growth, while a positive relationship exists over the range of negative to moderate inflation. Our results confirm a positive relationship between inflation and growth at moderate inflation levels, and support the contention that the relationship between inflation and growth is nonlinear over the entire sample range.

JEL codes: E3, E5, E6, E31, E42, E52, E58, E65
Keywords: inflation, deflation, depression, growth, empirics.

POLICYMAKERS SINCE THE Great Depression have been concerned that deflation can lead to lower growth rates, if not recessions, and the recent Japanese experience has exacerbated such concerns (see Krugman 1998). However, theoretical models offer differing perspectives. Milton Friedman's argument that for economic efficiency the nominal interest rate should be zero and that the price level should fall steadily at the real rate of interest is well known and has been formally reconfirmed by Chari, Christiano, and Kehoe (1996) and by Cole and Kocherlakota (1998) (see also Benhabib and Bull 1983). Others, working with calibrated models embedding sticky prices and market distortions, find the Friedman rule nonoptimal

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JESS BENHABIB *is from New York University* (*E-mail:* jess.benhabib@nyu.edu). MARK M. SPIEGEL *is from Federal Reserve Bank of San Francisco* (*E-mail:* Mark.spiegel@sf.frb.org).

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(Schmitt-Grohe and Uribe 2004). More to the point, Auerbach and Obstfeld (2005) find that the welfare and output costs associated with liquidity traps and deflations can be very significant.

Empirical evidence on the correlation between inflation and economic performance has cast doubt on the existence of a strong relationship. In a recent paper, Atkeson and Kehoe (2004) demonstrated the lack of a robust empirical relationship between inflation and growth for a cross-section of countries with nineteenth- and twentieth-century data, concluding that the historical evidence only provides weak support for the contention that deflation episodes are harmful to economic growth. Bruno and Easterly (1998) also fail to find a relationship between inflation and growth over 30-year cross-country data, but they do find a negative relationship between high inflation—exceeding 40%—and growth over high-frequency data (see also Ghosh and Phillips 1998).

Folklore has it that too much inflation (hyperinflation) is bad for the economy because it increases "shoe-leather" costs and that deflation is also bad because prices are sticky, or because of other less-well-understood reasons that have something to do with expectations. If so, we should not expect a linear relation between growth and inflation, but an inverted U-shaped one. In this paper, we reexamine the long-term evidence on inflation and growth by considering such a nonlinear relationship.

Following the methodology of Atkeson and Kehoe (AK; 2004), we are only attempting to characterize the empirical relationship between inflation and economic growth, and do not claim that there are any causal conclusions from our results. Our analysis speaks to AK's conclusion based on a linear specification that the data show no obvious relationship, which raises the bar for those who claim that deflation and depression are closely linked. It may be the case that our nonlinear specification might proxy for other missing variables that might be included in a more structural specification.

Using a long cross-country panel data set of 5-year growth episodes, we examine a nonlinear specification that allows for the capture of an inverted U-shape. We obtain a large and statistically significant estimate of the relationship between inflation and growth in ranges of moderate to negative inflation.

We then divide the sample according to inflation levels, using both the Hansen (2000) method and an imposed break at the sample 50th percentile. These correspond in our full sample to annual inflation rates of 3.23% and 2.44%, respectively.[1] We examine a simple linear specification for the subsamples with average 5-year inflation levels below and above these threshold levels. Our results again show that for subsamples limited to negative and moderate inflation levels, the relationship between inflation and growth is positive and quite strong.

1. We also divide the sample at the 75th percentile, which corresponds in our sample to a 5.57% annual inflation level and achieve similar results. These results are available on request.

1. DATA

Our data set is very similar to that in AK.[2] Our sample begins in 1859, as data for earlier 5-year episodes are often unavailable for more than two countries, and ends in 2004. Data on the general price level and output data up to 1980 are obtained from Rolnick and Weber (1997) and Backus and Kehoe (1992) for Argentina, Australia, Brazil, Canada, Chile, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom, and United States. These data run from early periods to 1992 through 1995 depending on the country. Remaining years are filled in using data from the IMF's *International Financial Statistics* (IFS).[3] The IFS data were merged with the original base data by multiplying the base data values by the ratio of the IFS value to the base data value in 1980.[4]

As in AK, we group the data into 5-year episodes that start and end in years 9 or 4, so that the entire depression is contained in a single 5-year subsample. We also follow AK by restricting our attention to moderate inflation or deflation, by restricting our sample to 5-year periods that average less than 20% inflation or 20% deflation, and between -10% and 20% annual output growth.[5]

In addition to the full sample, we also introduce a number of historical subperiods. We include the subperiods in AK: (i) the full sample excluding 1939–49 and 1929–34, (ii) the sample *Before World War II (WWII;* 1859–1939), and (iii) the sample *After WWII* (1950–2004). However, the data suggest that average inflation levels in our sample trended upward over time. This implies that separating the data by inflation levels may correspond to separating the data by historical events unrelated to inflation. As a robustness check, we also separate the full sample by episodes that appeared to result in substantive increases in average inflation worldwide. We divide the sample into three historical subsamples: (iv) the *Gold Standard* (1859–1914), which has

2. Differences from the original AK data set include 5 extra years of data for Italy, 1862–67, and 1 extra year for Argentina, Australia, and Denmark, 1884, 1861, and 1870, respectively.

3. An anonymous referee pointed out a number of errors in these original data sets. We thank him for his efforts. This alerted us to the possibility that other errors existed in these data sets as well. In response, we compared the base data set value to other data available for each country/year. A number of additional changes were subsequently made. Details concerning the changes to the base data as well as the final data set used in this study are available at http://www.frbsf.org/publications/economics/economists/mspiegel/BS_Inflation_data.xls. As an additional robustness check, we also used the means of available data rather than choosing a single source, and reran our specifications with this alternative data set. The results were very similar to those reported here. These results were provided to the referees and are also available on the web from the excel workbook listed above.

4. The price data are a combination of consumer price index (CPI) and gross domestic product (GDP) deflator data. This raises the possibility that using the GDP-deflator price data may introduce a spurious correlation between output growth and inflation. To investigate this possibility, we reran our specifications over the recent time period, during which price data from the CPI and the GDP price deflator are available. We obtained very similar results with both sources, suggesting that our results are insensitive to the use of either form of price data.

5. Similar results were obtained for data sets that included 5-year episodes of inflation of up to 40% per year, as in Bruno and Easterly (1998). These are also available upon request from the authors. The growth restrictions are not in AK, but only result in the removal of two outlier periods from the Netherlands, 1939–44 and 1945–49.

TABLE 1

SUMMARY STATISTICS

Sample period	Average inflation π	Average growth $\dot{y}$	Inflation volatility σ_π^2	$\rho(\pi, \dot{y})$	$\rho(\pi, \sigma_\pi^2)$	$\rho(\dot{y}, \sigma_\pi^2)$	No. of observations
Full sample	3.33	3.00	25.46	0.13	−0.01	−0.12	384
Excluding *WWII* and *Great Depression*	3.34	3.14	25.49	0.10	−0.02	−0.13	345
Before WWII	1.08	2.48	38.48	0.17	−0.001	−0.08	198
After WWII	5.43	3.58	9.50	−0.04	0.47	−0.09	163
Gold Standard	0.50	2.39	31.33	0.24	−0.20	−0.08	124
Mid 20th Century	3.81	3.59	32.22	0.06	0.13	−0.23	155
Great Moderation	4.96	2.59	8.48	0.08	0.43	−0.11	78

NOTES: Average levels of and correlations ($\rho(x, y)$) between inflation (π), growth ($\dot{y}$), and inflation volatility (σ_π^2). Definition of inflation volatility is in the text. Cross-country sample of 5-year period averages for 16 countries from 1859 through 2004. Great Depression and WWII periods run from 1929 to 1934 and from 1939 to 1949, respectively. Sample limited to 5-year episodes with average inflation with absolute inflation values less than 20% per year and average growth between −10% and 20% per year. Full sample is from 1859 to 2004. Historical subsamples include *Ex. WWII and Great Depression*, which excludes the years 1939–49 and 1929–34, *Before WWII* (1859–1939), *After WWII* (1950–2004), *Gold Standard* (1959–14), *Mid Twentieth Century* (1915–69), and *Great Moderation* (1980–2004).

average inflation rates of 0.50%; (v) *Mid Twentieth Century* (1915–69), which has average inflation rates of 3.81%; and (vi) the *Great Moderation* (1980–2004), which has average inflation rates of 4.96%.[6]

Summary statistics are shown in Table 1. Over the full sample, our data exhibit a positive correlation between average growth and average inflation equal to 0.13. However, the pre- and post-WWII subsamples demonstrate that these correlations change over time. For the pre-WWII sample, the correlation between inflation and growth is equal to 0.17, while the post-WWII correlation falls to −0.04.

2. NONLINEAR SPECIFICATION

We first estimate the relationship between inflation and growth under a nonlinear specification that satisfies

$$\Delta y_{it} = \alpha_i + \beta_1 \pi_{it} + \beta_2 (\pi_{it})^2 + \varepsilon_{it}, \tag{1}$$

where Δy_{it} represents average annual growth for country i during 5-year period t, α_i is a country-specific fixed effect, π_{it} represents average annual inflation for country

6. In a previous version of the paper (Benhabib and Spiegel 2006), we examined the entire *Post-Bretton Woods* era, from 1970 through 2004 as our final subsample. We substituted the shorter *Great Moderation* at the suggestion of a referee based on the consideration that this shorter period exhibited more homogeneity. However, the results for the entire *Post-Bretton Woods* subsample are available at http://www.frbsf.org/publications/economics/papers/2006/wp06-32bk.pdf.

TABLE 2

INFLATION AND GROWTH

Dependent variable: Average income growth						
				Correlation of fitted and data		
Sample	π	π^2	No. of obs.	Overall	Between	Within
Full sample	0.22***	−0.02***	384	0.08	0.02	0.08
	(0.06)	(0.004)				
Excluding *GD* and *WWII*	0.14***	−0.01***	345	0.05	0.001	0.04
	(0.05)	(0.003)				
Before WWII	0.19***	−0.01**	198	0.08	0.35	0.07
	(0.07)	(0.005)				
After WWII	0.23**	−0.02**	163	0.02	0.0004	0.05
	(0.11)	(0.01)				
Mid 20th Century	0.29***	−0.02***	155	0.12	0.10	0.13
	(0.10)	(0.01)				
Great Moderation	−0.07	0.01	78	0.02	0.30	0.01
	(0.14)	(0.01)				
Gold Standard	0.16	−0.02	124	0.06	0.02	0.07
	(0.10)	(0.01)				

NOTES: Ordinary least squares estimation with robust standard errors of 5-year period averages of growth on levels of inflation rates and inflation rates squared. Cross-country sample for 16 countries from 1859 through 2004. Great Depression and WWII periods run from 1929 to 1934 and from 1939 to 1949, respectively. See Table 1 for definitions of historical subperiods. Sample limited to 5-year episodes with average inflation with absolute inflation values less than 20% per year and average growth between −10% and 20% per year. Goodness-of-fit measures report overall-, between-, and within-multivariate correlations of fitted model and data. Constant term and fixed effect coefficient estimates suppressed.
*, **, and *** indicate statistical significance at 10%, 5%, and 1% confidence levels, respectively.

i during 5-year period t, and ε_{it} represents an i.i.d. normal disturbance term. We estimate using a panel specification with robust standard errors.[7]

Our results are shown in Table 2. We run the specification for the full sample and for the six historic subsamples. Inflation in levels enters positively, as expected, in our full sample and in five of the six subsamples. For the full sample, the coefficient on inflation indicates that an increase in inflation of 1% leads to an expected increase in average annual growth of 0.22%. Moreover, the coefficient on inflation in levels is statistically significant at the 1% level for the full sample and most of the historic subsamples. The exceptions are the early and late historical subsamples, as inflation in levels enters positively, but insignificantly for the *Gold Standard* subsample, and insignificantly with a negative point estimate for the *Great Moderation* subsample, which enters insignificantly with a negative point estimate.[8]

The nonlinear term enters negatively throughout, as was also expected, again with the exception of *Great Moderation* subsample, where it enters insignificantly with a positive coefficient estimate. For the full sample, the nonlinear term enters significantly negative at a 1% confidence level. Similar results are obtained when dropping

7. We also estimated a cross-section specification without fixed effects with robust standard errors and clustering by country. The results were quite similar and are available on request.

8. The relatively small *Great Moderation* subsample is strongly influenced by the performance of Chile from 1989 through 1999. Over this period, the Chilean economy averaged over 15% inflation, but growth was robust, averaging over 6.5%, largely due to appreciation in the price of copper.

the observations corresponding to the Great Depression and WWII, or when splitting the sample into pre- and post-WWII subsamples.

The data driving this result can be seen in Figure 1, which plots the fitted nonlinear specifications. Again, except for the post-WWII subsample, we find a pronounced nonlinear relationship between inflation and growth. Concentrating on the full sample, it can be seen that this nonlinearity is driven by the fact that episodes of very poor economic performance tend to be associated with high or low inflation levels, while episodes of exceptionally strong economic performance tend to be clustered around modest inflation levels.

It should be acknowledged that the reported goodness-of-fit measures indicate that inflation alone explains little of the variation in the data, both within- and between-country observations. This is not surprising given our parsimonious specification. We do get higher between-country variation when the sample is restricted to the before or after WWII subsamples, but the poor fit of between-country variation for the full sample indicates that a substantial amount of variation takes place within countries across time.

3. SAMPLE SPLIT INTO HIGH AND MODERATE INFLATION LEVELS

The results above provide some indication that the relation between inflation and economic performance is nonlinear, although the sample may be too noisy to closely fit a nonlinear specification. In this section, we instead split our samples in two, above and below some threshold that may be associated with the level at which inflation begins to become problematic. Because the value at which this may occur is uncertain, we split the samples using two alternative approaches: we first use Hansen's (2000) regression-based method of threshold estimation to choose and then test for an inflation threshold. This method yields asymptotically balanced threshold confidence intervals based on inverting the likelihood statistic, as well as valid probability values for parameter instability at the threshold. As a robustness check, we also impose a threshold at the 50th percentile and conduct an F-test to determine whether or not the data suggest that the coefficient estimate on the level of inflation is stable above and below this threshold.

We estimate the simple linear specification

$$\Delta y_{it} = \alpha_i + \beta_1 \pi_{it} + \varepsilon_{it}, \tag{2}$$

where the parameter definitions are the same as those in equation (2). We report Lagrange multipliers (LM) and F-statistics for the existence of a threshold for the estimated and 50th percentile thresholds, respectively.

Because our sample panels are unbalanced, and the imposed inflation threshold may also divide individual countries unevenly, the remaining historical subsamples often end up with very small numbers of observations for individual countries on either side of the threshold. As a result, we do not include country-specific fixed effects in the specifications for our smaller historical subsamples.

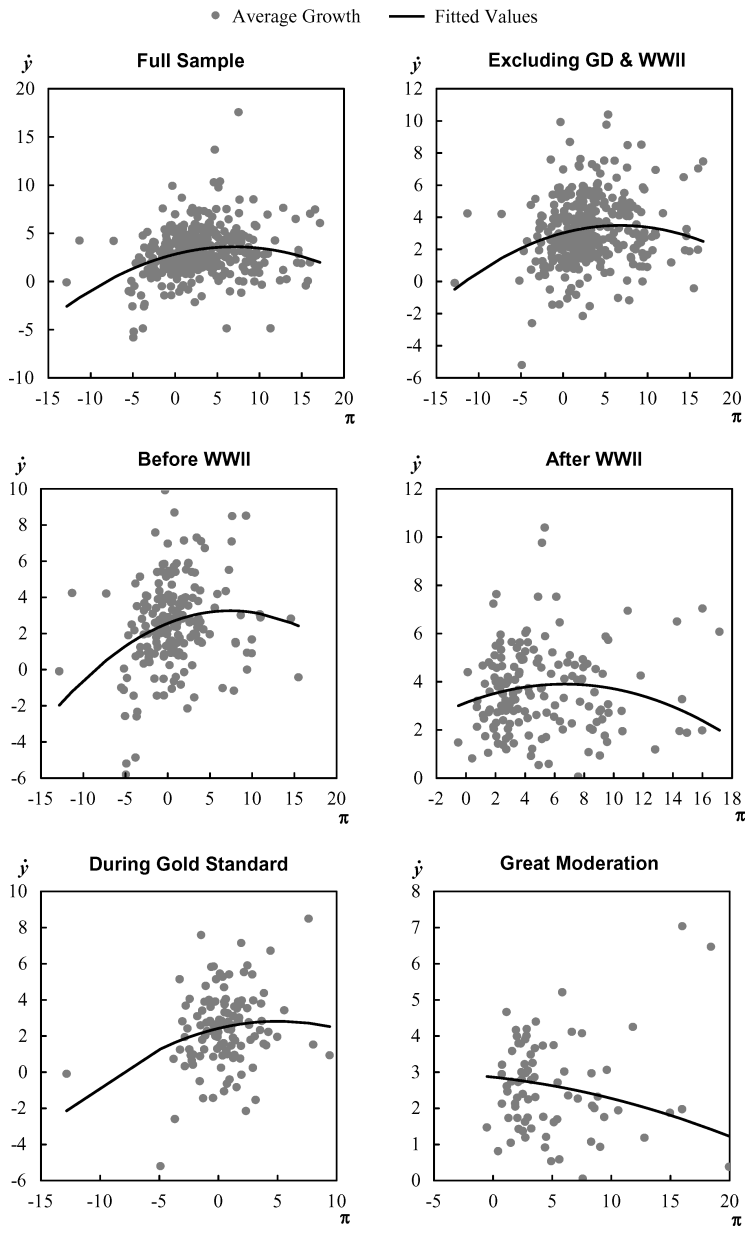

FIG. 1. Inflation and Growth.

NOTES: Cross-country sample for 16 countries from 1859 through 2004. Great Depression and WWII periods run from 1929 to 1934 and from 1939 to 1949, respectively. Fitted line corresponds to point estimates in specification in Table 2. See Table 1 for definitions of historical subperiods. Sample limited to 5-year episodes with average inflation with absolute inflation values less than 20% per year and average growth between −10% and 20% per year.

Our results are shown in Table 3. For the full sample, the Hansen method chooses an inflation threshold of 3.23%. For inflation below the estimated threshold, we obtain a coefficient estimate on inflation equal to 0.30, which is significant at a 1% confidence level. In contrast, the coefficient on inflation above the 3.25% threshold is −0.18, and is also statistically significant at a 1% confidence level. Our LM test for a structural break above and below the threshold is significant at a 10% confidence level. We obtain similar results with WWII (1939–49) and the Great Depression (1929–34) excluded. The coefficient on inflation is still positive and significant at 0.16 for the sample below the threshold and negative and significant at −0.15 for the sample above the threshold, at 5% and 1% significance levels, respectively.

Moving to the historical subsamples, we obtain positive point estimates for the coefficient on levels of inflation for all historical subperiods, though not always at statistically significant levels. In particular, the level of inflation enters insignificantly in the *Pre-WWII* and *Mid Twentieth-Century* periods. However, the sample-splitting

TABLE 3

SAMPLES SPLIT BY INFLATION

Panel A. Estimated thresholds (Hansen)

	Threshold estimate (π^*)	β-coefficient, subsample below threshold ($\pi \leq \pi^*$)	β-coefficient, subsample above threshold ($\pi > \pi^*$)
Full sample	3.23*	0.30***	−0.18***
p-values and std errors	(0.07)	(0.08)	(0.04)
No. of obs.		229	155
Goodness of fit		0.18	0.21
Excluding *WWII* and *GD*	3.32*	0.16**	−0.15***
p-values and std errors	(0.08)	(0.07)	(0.04)
No. of obs.		209	136
Goodness of fit		0.14	0.30
Before WWII	−1.55***	0.11	−0.03
p-values and std errors	(0.001)	(0.17)	(0.05)
No. of obs.		44	154
Goodness of fit		0.01	0.002
After WWII	8.21	0.15**	0.01
p-values and std errors	(0.29)	(0.07)	(0.12)
No. of obs.		129	34
Goodness of fit		0.03	0.001
Gold Standard	0.65	0.38**	0.18
p-values and std errors	(0.61)	(0.15)	(0.20)
No. of obs.		66	58
Goodness of fit		0.12	0.03
Mid 20th Century	−0.46***	0.19	−0.18***
p-values and std errors	(0.00)	(0.27)	(0.05)
No. of obs.		32	123
Goodness of fit		0.02	0.08
Great Moderation	4.21	0.28**	0.11
p-values and std errors	(0.34)	(0.13)	(0.10)
No. of obs.		46	32
Goodness of fit		0.07	0.07

(*Continued*)

TABLE 3

CONTINUED

Panel B. Samples split at 50th percentile

	π^*	$\pi \leq \pi^*$	$\pi > \pi^*$
Full sample	2.44***	0.34***	−0.12***
p-values and std errors	(0.00)	(0.10)	(0.04)
No. of obs.		192	192
Goodness of fit		0.13	0.02
Excluding *WWII* and *GD*	2.44***	0.18**	−0.08**
p-values and std errors	(0.01)	(0.09)	(0.04)
No. of obs.		173	172
Goodness of fit		0.05	0.01
Before WWII	0.49**	0.41**	−0.06
p-values and std errors	(0.03)	(0.18)	(0.05)
No. of obs.		99	99
Goodness of fit		0.11	0.003
After WWII	4.19**	0.41**	−0.14**
p-values and std errors	(0.02)	(0.17)	(0.07)
No. of obs.		82	81
Goodness of fit		0.07	0.02
Gold Standard	0.51	0.40**	−0.02
p-values and std errors	(0.39)	(0.20)	(0.23)
No. of obs.		62	62
Goodness of fit		0.11	0.02
Mid 20th Century	3.23***	0.45***	−0.30***
p-values and std errors	(0.00)	(0.14)	(0.06)
No. of obs.		78	77
Goodness of fit		0.27	0.09
Great Moderation	3.22	−0.06	−0.09
p-values and std errors	(0.28)	(0.27)	(0.09)
No. of obs.		39	39
Goodness of fit		0.04	0.02

NOTE: Ordinary least squares estimation with robust standard errors of 5-year period averages of growth on levels of inflation rates. Cross-country sample of 5-year period averages for 16 countries from 1859 through 2004. Great Depression and WWII periods run from 1929 to 1934 and from 1939 to 1949, respectively. See Table 1 for definitions of historical subperiods. Panels split by Hansen (2000) estimation method and by 50th percentile of inflation in sample. Estimation conducted with country-specific fixed effects for full and excluding GD and WWII samples under Hansen estimation, and for all subsamples for split by percentiles. Fixed effects not included for historical subsamples under Hansen estimation. Figure in parentheses below π^* reports *p*-value of not having a threshold at designated π^* using Lagrange multiplier and *F*-statistics for estimated and percentile sample splits, respectively. Other figures in parentheses are standard errors of corresponding coefficient estimates. Goodness-of-fit measures report R^2 statistic for estimated thresholds and multivariate correlations of fitted model and data for samples split by percentiles. Constant term and fixed effect coefficient estimates suppressed.
*, **, and *** indicate statistical significance at 10%, 5%, and 1% confidence levels, respectively.

methodology yielded implausibly low-inflation threshold estimates for both of these subsamples at point estimates of −1.55 and −0.46, respectively. Still, the point estimate on inflation is positive below the threshold for both subsamples. We obtain positive and statistically significant point estimates on the level of inflation for the low-inflation subsample for all of the remaining historical periods. The more recent *Post-WWII* and *Great Moderation* subperiods obtain inflation threshold estimates of 8.21% and 4.21%, respectively, although neither threshold estimate is statistically significant. The coefficients of interest on inflation for the low-inflation subsample are 0.15 and 0.28, respectively, both statistically significant at a 1% confidence level. Finally, the threshold estimate for the earlier *Gold Standard* period is 0.65. Below this threshold, we obtain a positive and statistically significant coefficient estimate on inflation equal to 0.38.

In contrast to these relatively strong results below our estimated inflation thresholds, our subsamples above the inflation thresholds are all either negative at standard significance levels or insignificant. We should also note that our R^2 estimates again indicate that much variability remains unexplained, but we obtain a respectable value of 0.18 below the inflation threshold for the full sample.

The results for sample separation at the 50th percentile are similar. The inflation threshold estimate for the full sample is 2.44, and our F-test confirms that the break is statistically significant at a 1% confidence level. The inflation coefficient below the threshold is similar at 0.34 and is again statistically significant at a 1% confidence level. Above the threshold we obtain a -0.12 inflation coefficient, again significant at a 1% confidence level. For the full sample excluding WWII (1939–49) and the Great Depression (1929–39), we again obtain a threshold of 2.44, which is again statistically significant at a 1% confidence level. As in the case of the Hansen splitting method, the coefficient estimates for this subsample are smaller in absolute value, at 0.18 and -0.08, respectively, with both coefficient estimates statistically significant at 5% confidence levels. The goodness-of-fit measure, here the correlation between the model fit and the data, is 0.13 for the portion of the full sample below the inflation threshold.[9]

Turning to the historical subsamples, one notable distinction is that we now obtain positive coefficient estimates on inflation below the inflation threshold for both the *Pre-WWII* and *Mid Twentieth-Century* subperiods of 0.41% and 0.45%, respectively, at 1% confidence levels. This supports our conjecture that the weaker performance of inflation levels over these subperiods using our estimates threshold levels was an artifact of our low threshold estimates. Indeed, with the exception of the smaller *Great Moderation* subperiod, for which we obtain an insignificant negative point estimate, all of the historical subperiods obtain positive and statistically significant coefficient estimates on inflation for the low-inflation subsample.

As before, the results above the inflation thresholds are quite different. All of the point estimates on inflation are negative, with half of the subsample point estimates entering negatively at statistically significant levels.

Overall, our results support the hypothesis of a positive relationship between inflation and economic growth within the range of low to moderate inflation, and of a negative or insignificant relationship above that threshold. These results appear to be robust to dividing the data into a variety of historical subsamples with the exceptions noted above, and to either estimating the inflation threshold using the Hansen (2000) method or splitting the sample at its 50th percentile.[10]

9. We also examined the split-sample results with the inflation-squared term included. This term was consistently insignificant, and the results for levels of inflation were similar to those in Table 3. In particular, levels of inflation for the low-inflation subsample continue to enter positively. These results have been provided to the referees and are available from the authors upon request.

10. In a previous version of the paper (Benhabib and Spiegel 2006), we examine the robustness of our results to conditioning for inflation volatility. It has been argued (e.g., Barro 1976, Judson and Orphanides 1999) that inflation volatility is the main cause of low growth during high-inflation episodes. Our results are robust to including inflation volatility, as growth is positively related to inflation at moderate inflation levels. These results have been provided to the referees and are available from the authors upon request.

4. CONCLUSION

This paper reexamines the long-term evidence on inflation and economic performance by allowing for inflation and economic performance to follow a nonlinear relationship. We find that for low and negative inflation levels, the correlation between inflation and economic performance is quite strong. For example, when we divide our sample into low to moderate and higher inflation subsamples, we find that below our estimated 3.23% threshold, our coefficient estimate indicates that a 1% increase in average inflation levels is associated with a 0.30% increase in average annual growth. In contrast, for the subsample of inflation episodes above this threshold we find that the same 1% increase in average inflation is associated with a 0.18% decrease in average annual growth. These results are predominantly robust to dividing our sample into various historical subsamples and the inclusion of a measure of inflation volatility.

We reiterate AK's warning that there is no causality claim here, but, as in their case, we are just observing the correlations between these two variables. However, our results contrast with those in earlier studies for low and negative inflation levels, over which the data do appear to indicate a large and statistically significant link between inflation and economic performance.

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