Why Do Inflation Rates Vary Across Countries?

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Globalization has brought about increased international interdependence, making the linkages between inflation rates across countries more apparent. Recent events such as the COVID-19 pandemic and the escalation of the Russian-Ukrainian war serve as a poignant reminder of the high responsiveness of national inflation to global shocks in the era of hyperglobalization. This observation raises a fundamental research question: given that global factors play critical roles in domestic inflation across countries and all countries face common global shocks, why do inflation rates still vary significantly across countries?

Drawing inspiration from the arbitrage pricing theory (APT) and multifactor models in asset pricing studies, I propose that a few common global factors capturing world business cycle fluctuations determine inflation across countries. However, different countries may have varying sensitivities to these systematic factors, leading to heterogeneous expected inflation rates in the cross-section. I also postulate a linear relationship between countries' inflation and their sensitivities (exposures, loadings, or betas) to the common factors. This assumption is similar to that in cross-sectional asset pricing, which implies that Fama-MacBeth (FM) two-step regressions can be a valid tool for empirical estimation.

To more intuitively reflect a country's inflation performance relative to others, I construct excess inflation rates (EIR) as the variable of interest. The EIR for a country is defined as its domestic inflation rate (IR) minus the contemporaneous global inflation rate (GIR). As there are no previous studies that have linked common global factors to cross-sectional heterogeneity in countries' EIR, I rely on economic rationale to motivate factor selection. The six benchmark factors employed in this study include three procyclical factors: the energy price index, the agriculture price index, and the composite leading indicator, and three countercyclical factors: the global unemployment rate, the precious metals price index, and the world uncertainty index.

Specifically, this paper examines monthly fluctuations in consumer prices across 181 countries from January 1990 to February 2022 and documents significant cross-sectional differences in countries' excess inflation rates (EIR). The study reveals a wide range of EIR, with the minimum and maximum time-series mean EIR being -3.81% (Japan) and 26.35% (Sudan), respectively, while the median EIR is around 0.03%, which stands in stark contrast to the cross-sectional standard deviation of 9.26%.

The FM time-series regressions reveal that the sensitivities (betas) of the sample countries' excess inflation rates (EIR) to the common global factors exhibit significant heterogeneity, which then leads to the observed cross-sectional differences in countries' expected EIR, as demonstrated by the FM cross-sectional regressions. Notably, the estimated lambdas from the FM second-stage regressions are positive for procyclical factors and negative for countercyclical factors, implying that countries with procyclical EIR generally have higher average EIR than those with countercyclical EIR.

The six benchmark factors are highly significant and robust to various model specifications, accounting for up to 41% of the cross-sectional heterogeneity in sample countries' EIR.

Moreover, single-factor models with nine other global factors, comprising seven procyclical and two countercyclical factors, yield results consistent with the primary findings. Moreover, the empirical results hold up under different rolling window analyses, underscoring the robustness of the findings.

The data also reveal a negative correlation between countries' per capita GDP and their EIR, with a correlation coefficient of approximately -0.41. To further investigate this relationship, I partitioned the sample countries into two groups based on their per capita GDP and observed a similar ratio of countries with procyclical EIR to those with countercyclical EIR in both groups, at 56:34 in the lower GDP group and 51:39 in the higher GDP group. Subsequently, when I conducted separate FM regressions for each group, the estimates were consistent with the primary findings. The empirical results are significant in both groups, with the explanatory power reaching up to 48% in the group with higher GDP per capita.

For the empirical observations, this paper offers the following interpretation: Consumers' aversion to higher inflation is asymmetric across different economic situations. For instance, rising inflation during recessions is more painful for consumers than during economic expansions. As economies experience varying inflation cycle fluctuations, consumers in different economies may exhibit different consumption behaviors. Specifically, in economies with countercyclical EIR, consumers are more cautious and sensitive to adverse economic shocks, leading to lower aggregate demand for consumption than in economies with procyclical EIR. The lower aggregate consumption demand results in less spending, a lower velocity of money, and ultimately leads to lower inflation in economies with countercyclical EIR. As a result, economies with more procyclical EIR tend to have higher average EIR, while those with more countercyclical EIR tend to have lower average EIR.

The comparison with the cross-sectional asset pricing theory is intriguing. As consumers, economic agents favor lower inflation due to its purchasing power erosion effects, while as investors, they are attracted to higher returns on their investment assets. The increasing inflation (decreasing return on assets) makes consumers (investors) more anxious if it tends to happen during recessions, as the rising cost of living (losing money on investments) is especially excruciating when economic agents are likely to lose their jobs. Therefore, economic agents make different consumption (investment) decisions based on the varying features of inflation (asset returns), which in turn affects the dynamics of consumer goods prices (asset prices) and, ultimately, inflation (asset returns). The rationale behind consumption and investment decisions is reversed, but theoretically, it leads to lambdas of systematic factors having the same sign.

Compared to the literature, this paper presents a unified approach for all types of economies and examines inflation differences across countries from a more macro perspective. It is fundamentally consistent and complementary to previous studies. The country-specific factors in previous research reflect the differences in countries' economic functioning, which are captured in this paper by the varying factor loadings (betas) of countries' EIR to common global factors. The various country-specific factors in the literature can be seen as concrete explanations for why one country's inflation responds differently to the common global factors than other countries in this paper.