Globalization: The Elephant in the Room That Is No More

By Enrique Martínez-García

Unlike what has been conventionally argued, the forces of globalization appear to be—if anything—a headwind to the conduct of monetary policy for the purpose of macroeconomic stabilization.

Several decades of increasing global economic integration—or globalization—have left their mark. Whether this structural shift has altered the conduct of monetary policy or its ability to promote economic stability over the business cycle has long been debated.[1] Woodford (2010), among others, convincingly argued on theoretical grounds that globalization does not necessarily imply a weakening of the ability of national central banks to influence domestic output and inflation. However, the question of monetary policy effectiveness is only part of the story.

As Bernanke (2007) puts it, our current understanding is geared toward the view that "[a]t the broadest level, globalization influences the conduct of monetary policy through its powerful effects on the economic and financial environment in which monetary policy must operate." Much of the literature—including my own work—has in fact focused on how globalization may have changed the economic environment and, thus, altered the trade-off between output and inflation volatility for monetary policy. It is known that the business-cycle volatility of the largest economies, including the U.S., has shifted significantly during the post-World War II period. The question, then, is to what extent those changes reflect globalization?

This essay draws heavily on the analysis of Martínez-García (2014b), which extensively reviews recent theory and the empirical evidence for the post-WWII period (starting in 1960) to shed light on the role of globalization. Based on data for eight major advanced economies (U.S., U.K., Germany, France, Italy, Spain, Japan and Canada), Martínez-García (2014b) shows a pattern of shifting business cycles partly linked to globalization. While a review of all plausible explanations to account for changes in the business cycle is beyond the scope of this review, the main takeaway is that no single hypothesis—including globalization—can quantitatively explain the volatility shifts observed since the 1960s.

Globalization, nonetheless, matters for policymaking. To the extent that more open markets have contributed to changes in business-cycle volatility, globalization has also played a role in shifting the trade-offs of monetary policy over time. Furthermore, unlike what has been conventionally argued, the forces of globalization appear to be—if anything—a headwind to the conduct of monetary policy for the purpose of macroeconomic stabilization. They may have even raised the costs of conducting monetary policy. That is not to say that globalization should be viewed negatively, but rather that its impact on the relevant policy trade-offs must be recognized when designing a successful monetary policy.

International Business Cycles: What Has Changed and Why It Matters

Business-cycle volatility is often described with the standard deviation that reflects how spread out data are around the average. Over time, how dispersed the data appear (the volatility) may change, but so can the averages. Martínez-García's (2014b) estimates of volatility (conditional standard deviations) are based on the robust model specification proposed by Stock and Watson (2003a, b) to identify volatility shifts whenever the central tendency (conditional mean) is also changing.[2] I reproduce those conditional standard deviation estimates of quarterly real gross domestic product (GDP) growth in Chart 1 and of quarterly inflation—derived from the GDP deflator—in Chart 2 to illustrate changes in business-cycle volatility in the U.S. and the other seven major advanced economies.

Bernanke (2004) notes that "[o]ne of the most striking features of the economic landscape over the past twenty years or so has been a substantial decline in macroeconomic volatility." The empirical evidence presented in Chart 1 shows a widespread decline in output volatility since the early 1970s. For the median advanced economy, the 1960s was a decade of rising output growth volatility, followed by a secular (and gradual) decline starting in the early 1970s. The downward trend stopped just before the 2008 global recession. That period of declining output volatility is known as the Great Moderation.

The Great Moderation in the U.S.—unlike for the median advanced economy—is characterized by a sharp decline in the conditional standard deviation of GDP growth around 1984 (Kim and Nelson 1999; McConnell and Pérez-Quirós 2000; and Stock and Watson 2003a, b). The U.S. also experienced a marked phase of elevated volatility during the 1970s coinciding with the collapse of the post-WWII Bretton Woods international monetary system and the high inflation and low growth (stagflation) that followed.

Inflation volatility rose in the late 1960s and early 1970s as the strains of the Bretton Woods system became more apparent and its collapse all but inevitable (see Chart 2). Interestingly, the data show a dramatic and widespread decline in inflation volatility between the mid-1970s and the mid-1990s, followed by an equally sizable—but uneven—rise afterward. For the median advanced economy, inflation volatility surpassed its previous historical peak in the mid-2000s. European countries in the years leading up to the adoption of the euro were most affected by this rise in inflation volatility. By comparison, inflation volatility remained fairly low in the U.S.

Output and inflation volatility breaks also occurred as other features of the international business cycle of the post-WWII period changed—notably, the cyclicality and cross-country correlation of inflation and the price level and the forecastability of growth and inflation, as discussed by Martínez-García (2014b). Interestingly, the most significant changes in business-cycle features for real variables—other than the secular decline in output volatility—appear at the onset of the 2008 global recession.

Chart 1
Real GDP Growth Volatility Declines
Scaled percentage
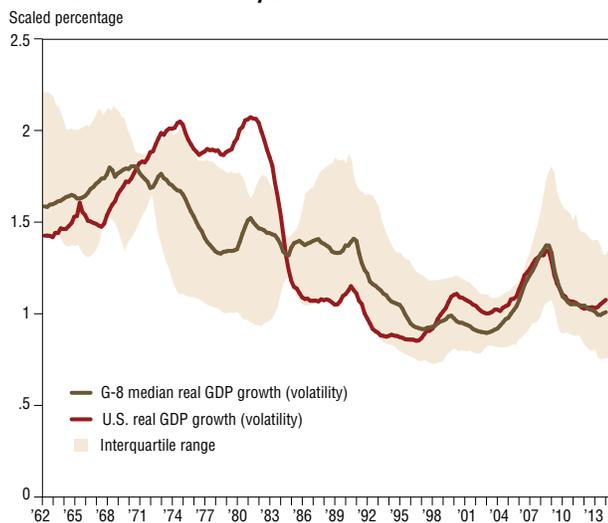
NOTE: Median and interquartile range includes U.S., U.K., Canada, France, Germany, Japan, Spain and Italy. The median measures the central tendency, while the interquartile range reflects the dispersion around the median of the countries in the sample. Volatility refers to the estimated time-varying standard deviation of real GDP growth.
SOURCES: Organization for Economic Cooperation and Development; author's calculations.

Chart 2
Inflation Volatility in G-8, U.S. Diverge
(GDP deflator)
Scaled percentage
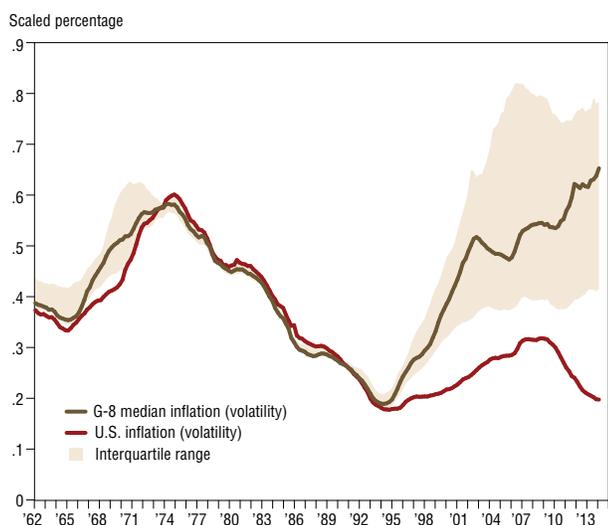
NOTES: Median and interquartile range includes U.S., U.K., Canada, France, Germany, Japan, Spain and Italy. The median measures the central tendency, while the interquartile range reflects the dispersion around the median of the countries in the sample. Volatility refers to the estimated time-varying standard deviation of inflation calculated with the GDP deflator.
SOURCES: Organization for Economic Cooperation and Development; author's calculations.

Martínez-García (2014b) finds no evidence of an increase in output growth synchronization for the period leading up to the 2008 global recession, suggesting weak empirical support for the hypothesis that globalization has altered international business-cycle synchronization. Consumption-smoothing motives, in theory, should imply a high correlation of consumption across countries regardless of the cross-country output correlation—at least if complete international risk-sharing were possible. Martínez-García (2014b) also documents that at least since the 1960s, cross-country output correlations tend to be consistently higher than cross-country consumption correlations. Backus et al. (1992) call this observation "the most striking discrepancy ... between theory and data."

The international literature has retained the idea that resolving this puzzle does not mean abandoning the view that asset markets are complete to the extent that they allow efficient risk-sharing across countries. Obstfeld and Rogoff (2001) suggest that "a (significant but plausible) level of international trade costs in goods markets" suffices to account for the comovement observed in the data.

Trade costs refer to transport costs and tariffs but may also include nontariff barriers and other structural distortions that impede intra-temporal consumption smoothing through trade. What matters for bilateral trade, however, are not the trade barriers between any two countries by themselves but how they relate to the barriers with respect to all their other trading partners. Martínez-García and Martínez-García (2014) show empirically that factors such as language, legal traditions, culture and historical ties—which generally change very slowly—can have major effects as relative barriers to trade. They find that the effect of nontariff trade barriers has remained largely invariant since the Great Moderation in spite of greater economic integration.

A number of other explanations have also been proposed—especially in the presence of distortions in goods and capital markets. Martínez-García and Søndergaard (2009) show, in particular, how comovement of consumption across countries depends crucially on the degree of international risk-sharing that can be attained and supported by trade.[3] Hence, from the perspec-

tive of theory, globalization—and financial globalization in particular—has an ambiguous effect on the comovement of output and consumption. While the debate is far from settled, globalization remains an important part of the discussion in regard to these business-cycle features.

How the Economic Environment Changed with Globalization

Much of the debate about the role of globalization has revolved around the perceived flattening of the short-run Phillips curve.[4] In fact, inflation seems to have become less responsive to fluctuations in output relative to its potential over time.[5] This has been documented for the U.S. by Roberts (2006), among others, who identified the flattening of the Phillips curve around 1984—at the start of the Great Moderation in the U.S. Borio and Filardo (2007) indicate that a similar phenomenon can be detected in a number of other countries. Their findings suggest a decline in the sensitivity of inflation to the domestic output gap—deviations of domestic output from its potential—among Organization for Economic Cooperation and Development countries, but a greater role for global slack—deviations of global output from its potential.

As in Martínez-García (2014b), a standard Phillips curve-based model can be estimated that relates current inflation to four past data points, or lags, and the previous quarter's domestic output gap (measured with Hodrick–Prescott [1997] filtered domestic real GDP). The coefficient on the domestic output gap in this model indicates the sensitivity of inflation to changes in domestic resource utilization, or slack. Chart 3, taken from Martínez-García (2014b), illustrates estimates of the coefficient on the domestic output gap.[6] Over time, the estimates have indeed declined, indicating decreased sensitivity of inflation to the domestic output gap.

The flattening has been more gradual in the U.S. than for the median advanced economy. The estimated coefficient increased temporarily during the 1980s. The major break occurred in the early 1990s when the estimate dropped below historical precedent. In the U.S., the coefficient has remained at approximately half of its pre-1990 peak. For the median advanced economy, the co-

efficient stayed below the U.S. value until catching up in the early 2000s. Interestingly, the estimates seem little changed in the aftermath of the 2008 global recession.

A number of empirical studies have challenged the notion that this evidence on the flattening of the Phillips curve is in fact related to globalization—see the arguments of Ball (2006) and Ihrig et al. (2007), which at least partially refute those of Borio and Filardo (2007). Martínez-García and Wynne (2010), however, suggest that the mixed empirical evidence to a degree reflects data limitations and mismeasurement.

Martínez-García and Wynne's (2010) arguments also fit into a much larger debate about whether the short-run Phillips curve has become flatter or, in turn, potential has shifted over time (see the views of Borio et al. 2013 on the role of financial factors in measuring the output gap). Martínez-García and Wynne's (2010) key insight is that changes in the slope of the Phillips curve cannot be estimated independently of the assumptions made about output potential (which is inherently unobservable). If potential output and thus the output gap are misspecified, one cannot conclude much about a possible structural change in the slope of the Phillips curve or simply negate the role of globalization from this evidence.

A more structural approach seems warranted, but Martínez-García, Vilán and Wynne (2012) and Martínez-García and Wynne (2014) show in controlled experiments with simulated data that there are significant challenges to identification and model selection that limit the practical usefulness of standard econometric techniques to reveal empirically the exact role of greater economic integration. In any event, even within a structural framework, estimating slack and the sensitivity of inflation to slack still requires that we take a stand on the specification of the unobservable potential output.

Another approach to investigate the plausibility of the theory—on the role of globalization—consists of identifying key empirical predictions that can help distinguish between competing explanations. Kabukçuoglu and Martínez-García (2014) show that Phillips curve-based forecasting models relying on the domestic output gap appear to have lost ground over time against simpler sta-

tistical models that aren't dependent on measures of slack—especially during the period of declining inflation volatility until the mid-1990s, as seen in Chart 2.[7]

More encouragingly, Kabukçuoglu and Martínez-García (2014) also suggest a number of indirect measures of global slack consistent with the open-economy Phillips curve (Clarida, Galí and Gertler 2002; Martínez-García and Wynne 2010). These are generally better measured than global output and more readily available and, in theory, should capture the relevant external economic forces. According to Kabukçuoglu and Martínez-García (2014), the most useful variables to restore—at least to some extent—the predictive ability of Phillips curve-based forecasts for inflation include terms of trade and global money growth.

The evidence of Kabukçuoglu and Martínez-García (2014) is consistent with the view that globalization has altered the trade-off implied by standard closed-economy Phillips curves, linking domestic inflation to global (rather than local) slack. It also appears consistent with a flattening

of the empirical Phillips curve as global forces come to dominate domestic ones. Thus, the global slack hypothesis articulated by Martínez-García and Wynne (2010, 2013) appears to offer an empirically plausible way to characterize inflation without abandoning altogether the idea of a short-run trade-off between inflation and real economic activity embedded in the Phillips curve.

It is also important to further consider how changes in inflation and the Phillips curve trade-off with real economic activity can in turn be linked to globalization. There are in fact a number of theoretical explanations for why structural changes in the slope of the Phillips curve through globalization may not necessarily linearly correlate with measures of greater openness and for why domestic inflation would be affected by global rather than local factors:

• Martínez-García and Wynne (2010) show that stronger bilateral ties through trade increase the direct contribution of import prices to measured domestic inflation. Greater openness is consistent with a decline in the Phillips curve slope on the domestic output gap and an increase

Chart 3

Estimated Coefficient on Domestic Output Gap Declines
(Sensitivity of inflation to domestic output gap decreases)*

Estimated coefficient
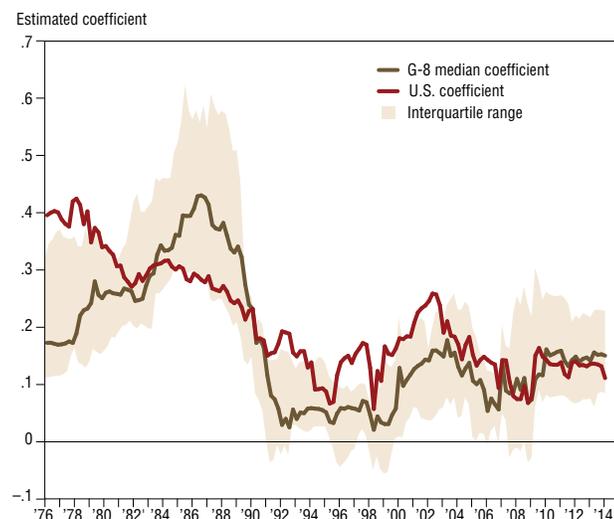
*Reduced-form Phillips curve model.
NOTES: Median and interquartile range includes U.S., U.K., Canada, France, Germany, Japan, Spain and Italy. Output gaps calculated with the Hodrick–Prescott (1997) filter on real GDP. The median measures the central tendency, while the interquartile range reflects the dispersion around the median of the countries in the sample. The coefficient estimates reported are based on a rolling window of 15 years of quarterly data.
SOURCES: Organization for Economic Cooperation and Development; author's calculations.

in the slope on the foreign gap. However, a more complex, nonlinear relationship may arise when countries differ in how open they are and how much more open they have become than the rest. This may explain at least qualitatively why measures of openness do not always appear to linearly correlate with the estimates of the slope of the Phillips curve.

• Imported goods may also affect inflation indirectly through their impact on the marginal costs faced by domestic producers and on their pricing power. Arguably, greater openness to trade and the resulting increase in competitive pressures may lead to reduced markups. These competitive pressures can also enhance productivity growth, as less productive firms get pushed out of the market, facilitating the goal of attaining lower inflation.

• The build-up of domestic slack makes it more difficult for firms to increase prices and for workers to negotiate higher wages, which keeps inflation at bay. However, in an increas-

ingly integrated world economy, reduced global slack can increase domestic inflation even when domestic slack remains invariant (a theoretical point argued by Martínez-García and Wynne 2010, 2013). As the economy becomes more open, it tends to matter more for domestic inflation that domestic firms can charge more for their goods in the domestic market when they face increases in world demand.

For all these reasons, it would appear too much of a stretch to refute the global slack hypothesis on the basis of the existing evidence (as can be seen in the arguments of Bernanke 2007 and Martínez-García and Wynne 2010, 2013, among others). A significant role for globalization is both theoretically plausible and not empirically inconsistent with nonlinear shifts in the slope of the Phillips curve, even if the question of how quantitatively important it ultimately is remains open to debate.

Globalization and Monetary Policy: Lessons Learned

Following Martínez-García (2014b), I consider the open-economy Phillips curve of Martínez-García and Wynne (2010) to be a valid framework to investigate the trade-off between inflation and real economic activity. I assume the economic structure and the distribution of shocks to be invariant. Under these baseline assumptions, New Keynesian economic models—which have featured prominently in policy analysis over the past two decades—imply that, over the long run, monetary policy makers operating under a Taylor rule framework (Taylor 1993) can reduce the volatility of inflation only by allowing greater relative volatility in output, and vice versa.

In other words, theory suggests a policy trade-off between the volatility in inflation and the ratio of output volatility over inflation volatility—similar to the well-known Taylor curve (for example, Taylor 1979, 2014). Chart 4, taken from Martínez-García (2014b), illustrates this variability trade-off with a model simulation based on Martínez-García and Wynne (2010, 2013). The model simulation aims to represent the trade-offs resulting from Taylor rules with different responses to inflation based on the experience of the major advanced economies during the Great

Chart 4

Monetary Policy and Variability (Volatility) Trade-Off

Ratio*
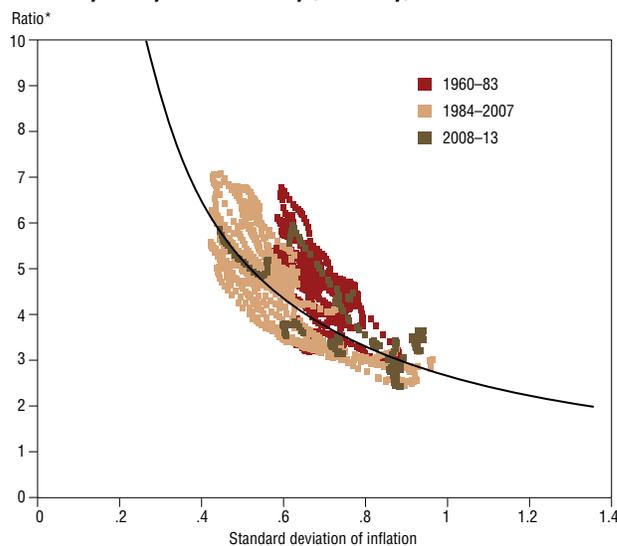
*Standard deviation of output/standard deviation of inflation.
NOTES: Includes U.S., U.K., Canada, France, Germany, Japan, Spain and Italy. Volatility is measured with estimates of the conditional standard deviations, that is the squared root of the variance. The curved black line is the simulated policy frontier under a policy framework based on the Taylor (1993) rule. This policy frontier is derived from simulations of the open-economy model of Martínez-García and Wynne (2010, 2013) for the period 1984–2007.
SOURCES: Organization for Economic Cooperation and Development; author's calculations.

Moderation (between 1984 and 2007).

In a purely mechanical sense, output fluctuations are expected to increase (output becoming more volatile) as the Phillips curve flattens if the fluctuations of inflation and output potential remain invariant. Hence, it is no surprise that Martínez-García (2014b) finds that the variability trade-offs between output and inflation faced by policymakers—if anything—may have shifted away from the origin as the Phillips curve leveled off down and the world economy became more integrated during the Great Moderation.[8]

Martínez-García (2014b) indicates that such a shift in the attainable policy trade-offs frontier under a Taylor rule can occur under the assumption of coordinated monetary policy. When de facto unilateral changes in monetary policy are considered, globalization appears to contribute also to a further widening of the distance in the policy frontier across countries and to greater divergence in policy performance.

While much more research is needed to fully understand the different aspects of globalization and how they interact with monetary policy, this analysis shows that the degree to which economies have become intertwined cannot be ignored in policymaking. Policymakers should be mindful that globalization has the potential to alter the volatility frontier that can be reached and make domestic stabilization policies increasingly dependent on the policies of other countries.

Conclusion

Ongoing global economic integration is a transformative phenomenon that has shaped the world economy for decades and will likely continue to do so. Globalization has not negated central banks' ability to influence domestic conditions. Nonetheless, globalization has had, and potentially will continue to have, an impact on inflation, the trade-off between inflation and real economic activity confronting policymakers, and the nature of the monetary transmission mechanism as suggested by the workhorse open-economy models of Clarida et al. (2002) and Martínez-García and Wynne (2010).

As Federal Reserve Bank of Dallas President Richard Fisher (2006) noted, "The literature on globalization is large. The literature on mon-

etary policy is vast. But literature examining the combination of the two is surprisingly small." Effective monetary policymaking requires more than ever before in the post-WWII period taking into account a diverse set of global factors, some of them not yet fully understood or even clearly identified. Scholars and policymakers must continue to further our understanding of the effects of globalization in general and on the conduct and international transmission of monetary policy in particular.

Notes

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[1] See, for example, Fisher (2005, 2006), International Monetary Fund (2006), Rogoff (2006), Yellen (2006), Bernanke (2007), Mishkin (2007), Weber (2007), González-Páramo (2008) and Papademos (2010).

[2] Shifts in the conditional mean have occurred and can presumably be related to globalization as well. This essay does not further pursue the issue.

[3] Other potential explanations to reconcile theory with data on consumption and output cross-correlations include: a) Frictions impeding the accumulation of capital (or affecting the relative price of investment), which can influence the economy's ability to absorb domestic and external shocks (see, for example, Martínez-García 2011 and Martínez-García and Søndergaard 2013); b) Incomplete asset markets in which there are not enough assets to attain perfect risk-sharing (Martínez-García 2011); c) Asymmetric information in the formation of expectations affecting the consumption–investment decision margin—particularly, with regard to foreign shocks (Martínez-García 2010)—or the pricing behavior of firms; d) The amplification/dampening effects of financial frictions on innovations to the mean or the volatility of the shocks (Martínez-García 2014a; Balke, Martínez-García and Zeng 2014).

[4] Phillips (1958) is credited with identifying the empirical inverse relationship between nominal wage changes and unemployment that bears his name and is regarded as the conceptual precursor of the New Keynesian Phillips curve used in this essay's arguments (Martínez-García and Wynne 2010). However, the idea behind the Phillips curve has a much earlier precedent in Fisher (1926) that should be duly noted.

[5] Output potential in this sense refers to the counterfactual level of output that could be attained given the same realization of the shocks to the economy if distortions preventing the full and instantaneous adjustment of prices could be

removed. The output gap, or slack of the economy, tracks the fluctuations in output around its potential. It measures the extent to which resources are underutilized/overutilized in production, and in the context of the New Keynesian Phillips curve, it can signal inflationary pressures.

[6] Chart 3 is based on a rolling window regression of the Phillips curve model for inflation based on four lags of itself and the previous quarter domestic output gap using 15 years of quarterly data. A rolling window regression involves running multiple regressions of a fixed sample size with a different window of observation at a time. In this case, the first regression is done on an initial window with the first 60 quarterly observations in the data. The second regression is performed with another 60 observations, starting from the second to the 61st observation. Similarly, the third window goes from the third to the 62nd observation, and so on. Using rolling window regressions produces varying estimates of the coefficient on the domestic output gap over time instead of a constant estimate for the entire period. In that sense, it reveals the changing properties of the regression—providing evidence of the flattening of the Phillips curve.

[7] Atkeson and Ohanian (2001), for instance, also show that backward-looking Phillips curve forecasts of U.S. inflation based on output gaps are often found to be inferior against a naïve forecast.

[8] The sacrifice ratio measures the reduction in output required for a given reduction in inflation. A flattening of the Phillips curve, therefore, may imply that the sacrifice ratio may have changed as well. This essay does not further explore this issue or its connection to globalization.

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