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Economic Letter

The Euro and Global Turbulence: Member Countries Gain Stability

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The pattern of adjustment of euro-area countries' external competitiveness to dollar and risk aversion shocks has become more similar since the euro's creation.

Discussions about Europe's role in a rebalancing of the global economy—specifically whether countries under stress, such as Greece, Ireland, Portugal or Spain, will close their competitiveness gaps with Germany—are part of a wider, long-standing debate about whether the euro's creation has changed the way countries sharing the single currency adjust to shocks.

A key question since the euro's launch in 1999 has been whether the costs associated with fixed exchange rates would exceed the potential integration benefits for members of the monetary union. In other words, now that differences in relative competitiveness across euro-area members can no longer be corrected by changes in exchange rates, how will real (inflation-adjusted) wages and other indicators of competitiveness adjust? This question is not specific to the euro; it is a classic dilemma in all monetary unions.

Discussions of this issue before the euro's debut largely focused on the asymmetric effects of global shocks—the extent to which shocks common to all euro-area countries could impact individual ones differently. If countries were hit by such shocks, patterns of macroeconomic performance might diverge. This could adversely affect the monetary union, whose smooth functioning is dependent on optimum conditions—including high labor mobility, price and wage flexibility, and sufficiently large fiscal transfers.

More than a decade after the euro's creation, it is possible to assess whether these concerns were justified. After the onset of the global financial crisis, some observers have argued that the euro area's initial design made it ill-prepared to avert the emergence of large differences in member competitiveness. Real effective exchange-rate evolution—relative price-level changes in each euro-area country with respect to those of its trading partners—has generally occurred since the euro's creation in 1999. Indeed, although bilateral exchange rates among member states are fixed, the trade weights of partner countries vary among member states, and domestic prices differ (*Chart 1*).[1]

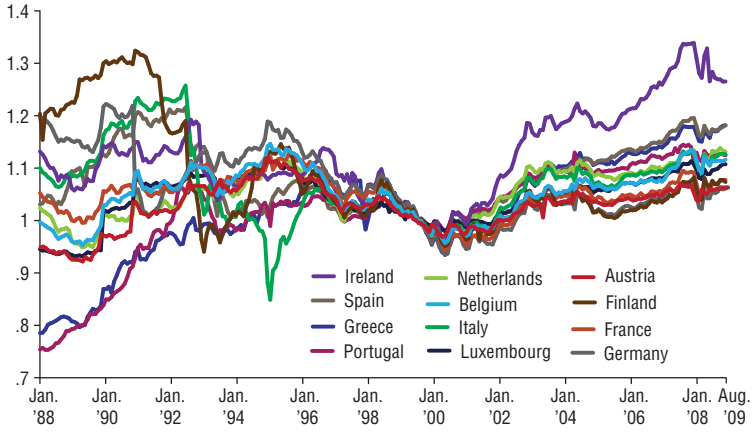
Accordingly, significant differences in external competitiveness persisted across euro-area countries, and these gaps grew ever wider until the outbreak of the global financial crisis.

Euro-area changes in real exchange rates can be examined using a global vector autoregression (GVAR) macroeconomic model to study the effect of two shocks common to all countries—a global shock affecting the dollar and a shock heightening global risk aversion.[2]

Individual euro-area countries' real exchange-rate responses appear to have become more homogeneous since the

Chart 1 Euro-Area Real Exchange Rates Show Persistent Differences

Exchange rates, normalized so that December 1999 = 1 (in natural logarithms)



SOURCES: International Monetary Fund; Bank for International Settlements.

common currency's creation, though to an extent dependent on the nature of the shock. Thus, the competitiveness performance of euro-area core and periphery countries reflects their differing development with regard to wages, productivity, other labor costs and non-price competitiveness factors. It is not mainly the result of global shocks' unequal impacts, per se, as initially envisaged at the time of the euro's launch.[3]

Global Shock Transmission

Tracing the effects of shocks across countries and time is difficult because of the multilateral nature of exchange rates and relative competitiveness. For instance, an increase in the relative price of currency A in terms of currency B may be ascribed to a strengthening of A or to a weakening of B (or even to a combination of both); in each case, underlying causes can differ appreciably. The GVAR model takes into account important features of the global economy, such as unobserved common effects, the dominance of the U.S. dollar in foreign exchange markets and neighborhood/spillover effects.[4] The model may be used to identify economically meaningful structural shocks such as global risk shocks. It is also useful for tracing the reaction of real exchange rates to shocks, given countries' interdependencies.

The model covers the real effective exchange rates of 60 countries, including all euro-area countries. The CBOE Volatility Index (the VIX), a measure of implied volatility on a hypothetical at-the-money option on the Standard & Poor's 500 Index, is widely used as a yardstick of global market uncertainty and risk aversion. The model uses 20 years of monthly data (the 10 years before and 10 years after the euro's creation).[5]

The GVAR methodology allows assessment of whether the euro's creation was a major turning point in the way real effective exchange rates of euro-area countries adjust to global shocks.

This is an open question for two reasons. First, even though nominal exchange rates of euro-area countries are fixed relative to each other, there is no implication that their individual, real effective exchange rates will react to shocks similarly. That is in part because roughly half of euro-area countries' trade is still with outside nations. Second, the big question is not merely whether adjustment to global shocks across euro-area countries has converged but, rather, to what has it converged? Is it convergence to a simple average of euro-area countries' patterns of adjustment before the currency union? Is it a convergence to the most credible economy before the euro? Or is it to something else?

World Dollar Shocks

Consider the impact of an unanticipated appreciation of the U.S. dollar before the euro's creation. In the model, a roughly 1.25 percent shock to the dollar's real effective exchange rate—amounting to one standard deviation, a size considered statistically typical—was associated with a 0.4 percent depreciation of the German mark (*Chart 2, upper panel*).

The bars in the chart represent the mean effect immediately after the shock, while the length of the associated line segments indicates the statistical uncertainty of the estimates. The currencies of Austria, Belgium, Finland, France, Ireland and the Netherlands depreciated pre-euro, by 0.1–0.3 percent. By comparison, Italy and Greece's real effective exchange rates tended to appreciate—though not to a degree that was statistically significant—while the exchange rates of Luxembourg and Portugal were unaffected. These results are partly reminiscent of findings from studies of dollar shocks conducted in the 1980s.[6]

After the euro's launch, the picture is completely different (*Chart 2, lower panel*). All euro-area countries' real effective exchange rates respond similarly to dollar shocks, including the exchange rates of Italy, Greece, Luxembourg and Portugal (which reacted differently before 1999). The same one-standard-deviation shock to the dollar's real effective exchange rate is associated with a 0.3 percent to 0.6 percent depreciation of all euro-area countries' real effective exchange rates. The pattern of adjustment of euro-area countries' external competitiveness to dollar shocks has become more similar since the euro's creation.

Intriguingly, this more homogeneous response is also now similar to that of one country—Germany—which issued the region's anchor legacy currency before the euro. The estimated response of the German real exchange rate to a global dollar shock is very similar before and after the creation of the euro. The estimated depreciation of its real effective exchange rate following a dollar shock increased by 0.1 percentage point, to about 0.5 percent.

Rising Global Risk Aversion

Consider how a global risk shock, represented by a rise in the VIX, motivates appreciation in safe-haven currencies and depreciation of some emerging-market ones.[7] Some of the euro-area legacy currencies were viewed as safe havens before the euro's creation, especially those of the

area's core. A rise in global risk generally led to an appreciation of these currencies (*Chart 3, upper panel*).

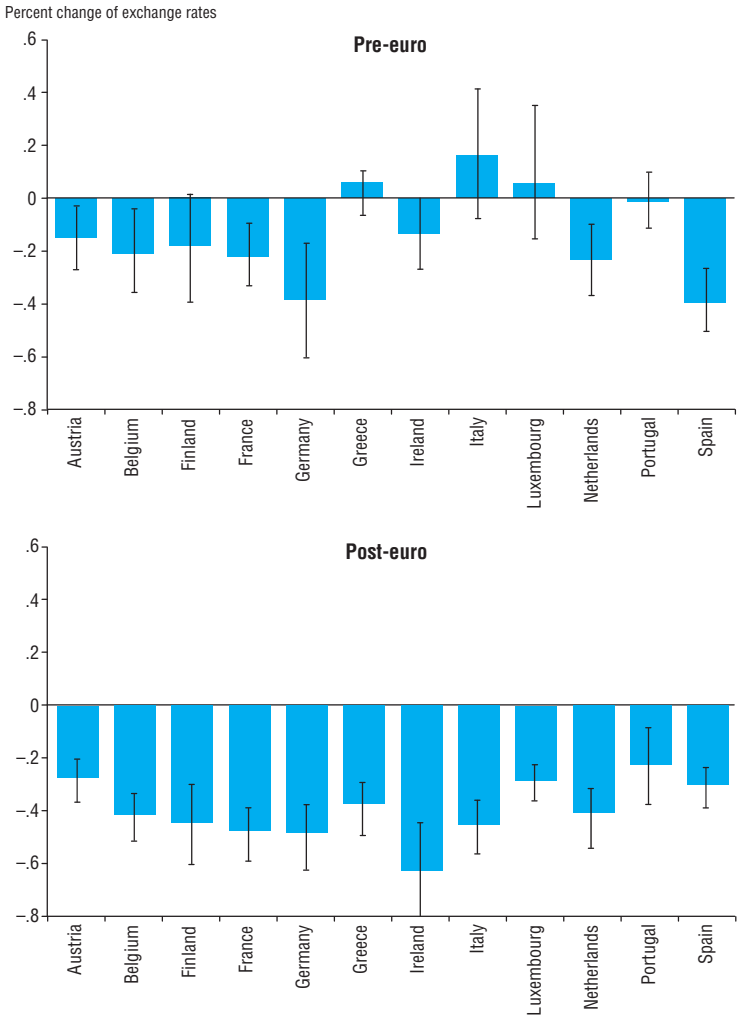
Global risk shocks were associated with a 0.5 percent appreciation of the German mark and a 0.2–0.5 percent gain for currencies of Austria, Belgium, Finland, France, Luxembourg and the Netherlands. The currencies of the countries at the area's periphery did not exhibit a safe-haven role—Italy, Spain and Portugal's real effective exchange rates tended to depreciate.[8]

After the euro's creation, the picture changed completely. Almost all euro-area countries' real effective exchange rates respond more similarly to global risk shocks (*Chart 3, lower panel*). The real effective exchange rates of most euro-area countries tend to depreciate contemporaneously, by 0.3–0.5 percent. In other words, their responses are now more similar to those of peripheral countries such as Spain or Italy prior to the euro's launch. These estimates are consistent with those obtained with dollar shocks. In both cases, after the euro's creation, the real effective exchange rate of individual euro-area countries depreciates when the dollar appreciates.

One interpretation of these findings is that they reflect the fact that the euro has become the globally most relevant alternative currency to the dollar, with a liquidity unmatched by any of the legacy currencies, and hence the main counterpart to dollar movements.

Still, a noteworthy change is Germany's response pattern to global risk aversion shocks, from appreciation before 1999—when the German mark had safe-haven status—to depreciation after 1999 along with all other euro-area countries. This has potentially important implications. For instance, euro-area economies might no longer be subject to marked appreciation pressures in periods of heightened global risk aversion. According to some observers, this brings undeniable benefits for euro-area members such as Germany. Before the euro, the German mark gained significantly when global uncertainty surged, leaving Germany to shoulder a large share of adjustment of global exchange rates and possibly negatively affecting its terms of trade—generally making German exports more expensive.

Chart 2 Dollar Shocks Lead to Weakening of Euro-Area Countries' Exchange Rates



NOTE: The chart shows the impact of a positive dollar shock on the real effective exchange rate, with 90 percent confidence bands.

SOURCE: Authors' calculations.

Policy Implications

GVAR exchange rate modeling suggests that the dissimilarities in external competitiveness across euro-area countries during the last decade—at the core of discussions about the region's future—are unlikely to stem from global shocks with asymmetric effects, as initially feared. They are more likely to originate from country-specific developments in price and non-price competitiveness, such as diverging labor costs, tax structure, productivity growth and product market regulations that have contributed to competitiveness gaps across member states.

Structural reforms are probably necessary in all euro-area countries, particularly in those that suffered losses of competitiveness after the euro's creation. The removal of barriers and limitations affecting labor and product markets would make a positive contribution to that end and help support these countries' adjustments.

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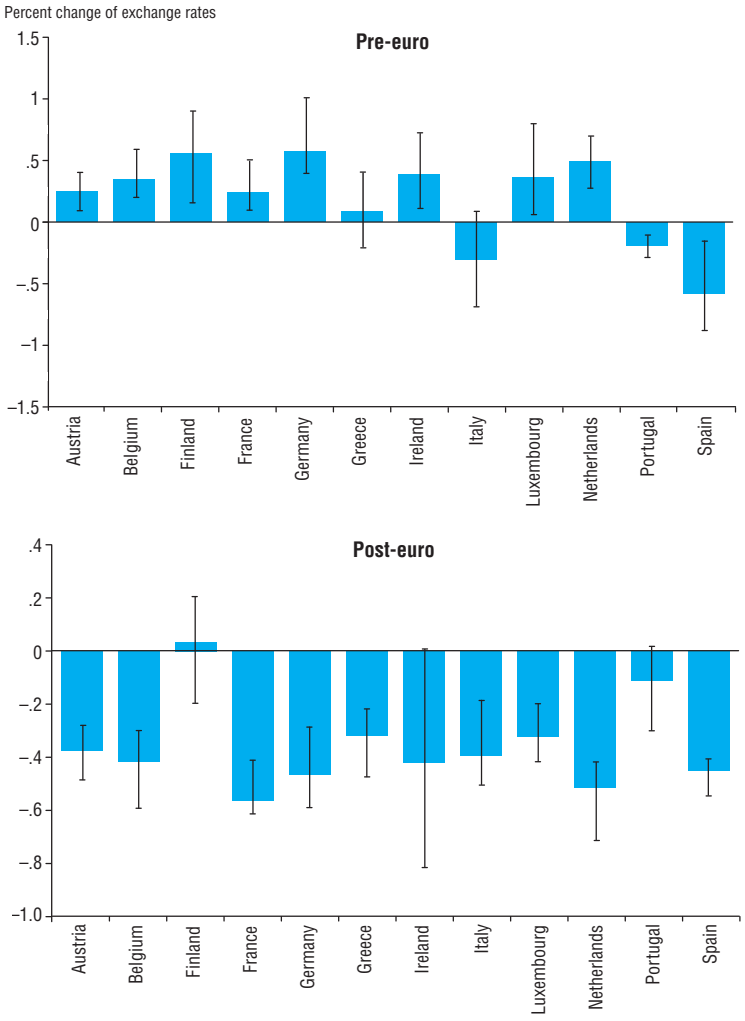
Chart 3 Euro-Area Currencies Weaker After Risk Aversion Shock



NOTE: The chart shows the impact of a positive global risk aversion shock on the real effective exchange rate, with 90 percent confidence bands.

SOURCE: Authors' calculations.

Notes

The views expressed are the authors' and do not necessarily reflect those of the Federal Reserve Bank of Dallas, Banque de France, European Central Bank or Eurosystem.

[1] The real effective exchange rate of the euro is a weighted average value of the euro relative to an index or basket of other major currencies, adjusted for the effects of inflation. It is a standard measure of external competitiveness.

[2] The GVAR methodology provides a general, yet practical, modeling framework for quantitative analysis of the relative impact of different shocks and channels of transmission mechanisms across a large number of countries (or units).

[3] The existence of such divergent country-specific evolutions is documented in "Competitiveness and External Imbalances Within the Euro Area," ECB Occasional Paper no. 139, European Central Bank, December 2012.

[4] See "Infinite Dimensional VARs and Factor Models," by Alexander Chudik and Hashem Pesaran, *Journal of Econometrics*, vol. 163, no. 1, 2011, pp. 4–22; also see "Econometric Analysis of High Dimensional VARs Featuring a Dominant Unit," by Alexander Chudik and Hashem Pesaran, *Econometric Reviews*, vol. 32, no. 5/6, 2013, pp. 592–649.

[5] For details of the model used to generate the empirical results, see "How Have Global Shocks Impacted the Real Effective Exchange Rates of Individual Euro Area Countries Since the Euro's Creation?" by Matthieu Bussière, Alexander Chudik and Arnaud Mehl, *B.E. Journal of Macroeconomics*, vol. 13, no. 1, 2013, pp. 1–48.

[6] See "The EMS and the Dollar," by F. Giavazzi, A. Giovannini, D. Begg and L. Katseli, *Economic Policy*, vol. 1, no. 2, 1986, pp. 455–85.

[7] Global risk shocks are identified using a statistical technique called "sign restrictions," which consists of restricting the signs of the responses in the GVAR model to shocks that lead to a contemporaneous rise in the VIX; an appreciation in the U.S. dollar, Japanese yen and Swiss franc (three currencies often considered by market participants as safe havens); and a depreciation in the Korean won and Polish zloty (two emerging market currencies).

[8] The impact was not statistically significant for Italy.

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