

The value-added trade weighted unit labor cost indicator (TWULC) – an alternative for calculating real exchange rates?

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Abstract:

This paper investigates the role of prices and unit labor costs for the export performance in a broad set of OECD countries. In the literature there is big discussion about which price or labor cost indicator to use best in export equations. Empirical tests, however, generally find a low explanatory power of price and cost indicators for the export performance and fail to show the dominance of one specific indicator when tested within standard export equations.

One explanation put forward is that cost and price developments in the sectors actually exporting might differ from those in sectors oriented at domestic demand. In particular in countries in a process of catching up, but also in countries subject to a housing bubble, unit labor cost developments in the internal sectors and in the trade oriented sectors may diverge substantially. Competitiveness measures such as the REER based on ULC developments in the entire economy may thus give misleading signals of the country's external competitiveness.

Another explanation for the disconnect between export performance and conventional REER measures is the growing interconnectedness and slicing of the value chains. Exports are measured in gross terms, and may embody imported goods, the prices of which are unrelated to domestic production costs. Price and cost competitiveness then depend not only on domestic trends but also on the nature of the value chain and the costs of imported components.

Information about interconnectedness and value added trade has become available recently through the WIOD (Timmer et al., 2012) and the TiVA (OECD/WTO, 2013). This has triggered theoretical and empirical investigations of the impact of growing interconnectedness on the competitiveness as measured by real exchange rates. Bems and Johnson (2012) suggested the value added real exchange rate (VA-REER) which uses GDP deflators as the price of domestic value added and country weights according to bilateral trade flows in value-added terms for 1970-2009 estimated by Johnson and Noguera (2012). They showed that these real exchange rates can deviate markedly from conventional rates based on the CPI and trade weights from gross flows. Bayoumi et al. (2013) proposed to include the price of foreign value added in trade into the real exchange rate measure. Their real exchange rate takes into account all production costs, domestic and foreign. Patel et al. (2014) calculated a range of effective real exchange rate indices at the country-sector level using WIOD data.

We add to this strand of literature by introducing a new real exchange rate indicator based on value added trade data. The basic intuition goes back to Gächter et al. (2013): to calculate price and cost measures that give more weight to those sectors that actually export. The involvement in exports is gauged from the world input-output databases and value added embodied in foreign final demand. In conventional measures of economy-wide deflators or unit labour costs, the individual sectors are (implicitly) weighted according to their share in total value added. The TWULC (trade weighted sectoral unit labor cost indicator) and the TWDEFL (trade weighted sectoral deflators) are derived from weighting sectoral price or cost information according to their weight in value added trade.

Our main hypothesis is that it is the cost based competitiveness (the TWULC) that might (still) be relevant for export performance. However, as deflators, i.e. the price of value added, have already been suggested in the literature as alternative measures of price competitiveness (the competitiveness of domestically supplied “tasks”), we have also tested the performance of the trade-weighted deflators (the TWDEFLs).

The TWULC for country k is calculated as the weighted average of sectoral ULC developments:

$$TWULC^k = \sum_{i=1}^n ulc_i^k * w_i^k$$

with the sector specific weight being $w_i^k = x_i^k / X^k$ with $X^k = \sum_{i=1}^n x_i^k$.

To construct the TWULC we use sectoral data from the Socio-Economic Accounts accompanying WIOD (World Input-Output Database) for a set of 38 OECD countries and 35 goods and service sectors. WIOD itself does not contain information about value-added trade. We therefore use data from the TiVA data base, which includes 18 sectors. These can be easily related to the sectors from the WIOD. The time frame spans from 1996 to 2008 due to the data availability on the sector-specific unit labor costs for this large country set.

The real exchange rates are then derived through the application of the TWULC and the TWDEFL as price measures on a standard REER formula, where the bilateral trade weights stem from the TiVA database and (for robustness check) from the WIOD (gross trade flows). For comparison we also calculated the REER based on the CPI, and economy-wide ULC and deflators.

We find that the TWULC indeed can differ substantially from overall ULC developments. In most cases, unit labor costs in the exporting sectors have indeed progressed more moderately than those in the non-exporting sectors. This divergence is larger for some countries and smaller for others. Moreover, there are exceptions to this rule. These include raw material exporters such as Russia and countries that experienced rapid inflation in the investigated period (Romania, Turkey).

However, when it comes to the real exchange rates based on the TWULC and the TWDEFL, it turns out there are not too few cases where the pattern reverses: while growth of the TWULC falls short of total economy ULC, the REERs based on the TWULC indicate a less favorable competitiveness performance than suggested by standard REER measures. This is because of the relative performance of the trade-weighted indicators between the countries.

Specifically, due to the very strong improvement of the unit labor costs of exporting sectors in the United States and Japan also relative to their own non-trading sectors, the improvement in their TWULC-REER has been far more pronounced than the changes in the REER based on standards price or cost measures. A counterexample would be Spain: even if the unit labor costs of the sectors exporting have developed more favorably than domestically oriented sectors, in relative terms, i.e. vis-à-vis the trading partners, the TWULC-REER has actually deteriorated more than what the standard measures of competitiveness suggest.

The usefulness of these new measures of competitiveness is then tested econometrically within panel estimations of standard export equations. The export equations use real exports of goods and services as dependent variable and – in the baseline – the alternative price/cost measures as explanatory variable as well as weighted external demand. We also added trade-weighted productivity growth (as a supply side indicator), the TWULC/ULC ratio (to test whether countries where the trade weighted ULCs have diverged more from the overall ULC have indeed performed better in exports) and import prices.

Preliminary tests indicate that the TWULC-REER is generally significant in export equations with slightly higher significance than alternative REER measures, but it does not appear to systematically outperform the latter. The TWULC-REER performs particularly well for a subset of high income countries, where the fit of the export equations is generally good. The performance of the trade-weighted deflators in these export equations is typically worse, and for some country sub-groups the deflators are insignificant.

So far the tests were performed for real exports of goods and services, i.e. a gross measure of exports. We intend to add a cross-section estimation with value added exports, deflated by the trade-weighted deflators, as the dependent variable.

Overall we come to the conclusion that – although in line with the literature we find no universal dominance of the TWULC for all countries – our new measure may give additional interesting insight for competitiveness assessments, and in particular for the group of the most developed economies.

References

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