

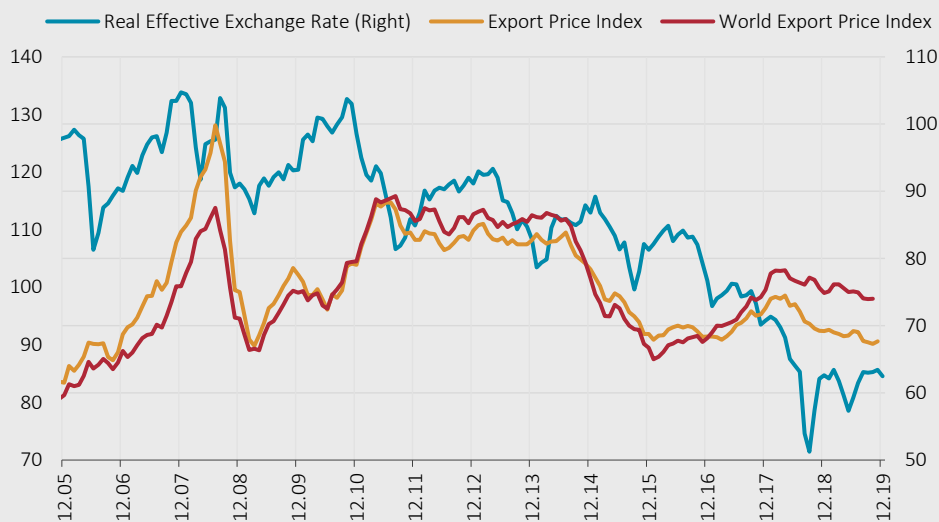
Box 4.2

Exchange Rate Pass-Through to Export Prices

When a local currency depreciates in real terms, exporters are expected to decrease their foreign currency-denominated export prices by a certain amount of the depreciation of the local currency, keeping other factors constant, to increase their export volumes. The depreciation in the local currency allows exporters to both increase their export revenues in local currency and gain competitive power by lowering their export prices in foreign currency to a certain level. This box focuses on the extent to which the movements in the real exchange rate are reflected in Turkey's export prices.¹ Besides, by estimating the degree of the exchange rate pass-through, we aim to obtain some clues regarding the power of Turkish exporters in determining prices at the macro level.

Turkey's US dollar-denominated export prices have followed a downward trend since 2011. While export prices co-moved with world export prices, the real exchange rate declined gradually in the post-2011 period (Chart 1). In this context, in order to measure how much of the depreciation in the exchange rate is reflected in US dollar-denominated export prices, it is important to estimate the exchange rate pass-through to export prices while controlling for the movements in world export prices. In this way, competitiveness gains can be interpreted more accurately.

Chart 1: Export Unit Value Index and CPI-based Real Effective Exchange Rate (2010 = 100)



Source: CBRT, Netherlands Bureau for Economic Policy Analysis (CBP), TurkStat.

Method and Data

Following Ceglowski (2010), the export price model below is estimated to quantify the exchange rate pass-through to export prices:

$$\Delta p_x^{USD} = \alpha_0 + \sum_{i=0}^3 \alpha_{1i} \Delta p_{f,t-i}^{USD} + \sum_{i=0}^3 \theta_i \Delta e_{t-i} + \sum_{i=0}^3 \beta_{0i} \Delta c_{t-i} + \beta_1 \Delta y_t^f + v_t$$

¹ Based on the ongoing research by Aydın and Gül (2020).

In this equation, p_x^{USD} is the export price of Turkey in US dollars, p_f^{USD} is the world export price or the competitors' export price in US dollars, e stands for the nominal exchange rate, c represents producer prices that control for input costs, and y^f is the global growth index that is weighted according to Turkey's export partners' shares. Variables are log-transformed. In the model, parameter θ shows the exchange rate pass-through to US dollar-denominated export prices while parameter α indicates the degree of pricing-to-market. Accordingly,

- $\theta = 0$ or $\alpha_1 = 1$ implies no exchange rate pass-through (or complete pricing-to-market)
- $\theta = 1$ or $\alpha_1 = 0$ implies complete exchange rate pass-through (or no pricing-to-market)
- $0 < \theta < 1$ or $0 < \alpha_1 < 1$ implies incomplete exchange rate pass-through (or incomplete pricing-to-market).

Turkey's producer price index and US dollar-denominated export prices are from TurkStat; exchange rates and the export-weighted global growth index for Turkey are from the Central Bank of the Republic of Turkey, and world export prices in US dollars are from the Netherlands Bureau for Economic Policy Analysis (CBP).

Main Findings

Table 1 summarizes the main results. Estimates suggest a statistically significant short-term exchange rate pass-through to Turkey's export prices at around 0.11. Put differently, a 10% depreciation in the Turkish lira causes US dollar-denominated export prices to decline by almost 1.1%. This finding is consistent with the findings of a recent study by Akgündüz et al. (2019) that examines the exchange rate pass-through to export prices in Turkey. Our results reveal that exporters have a relatively low degree of elasticity in setting prices in response to exchange rate shocks. Besides, the coefficient estimate of the short-term parameter α is around 0.80, which indicates that a 10% decline in world export prices leads to an 8% decline in Turkey's export prices. This shows that firms take world prices as given when determining prices for their export products.

Table 1: Exchange Rate Pass-Through (Nominal Exchange Rate)

Variables	Coefficient Estimates
D.e _t	0.107 (0.037)***
D.e _{t-1}	0.043 (0.040)
D.e _{t-2}	-0.026 (0.036)**
D.pf _t	0.795 (0.085)***
D.pf _{t-1}	0.115 (0.092)
D.pf _{t-2}	-0.125 (0.080)
D.c _t	0.146 (0.078)*
D.c _{t-1}	0.001 (0.075)
D.c _{t-2}	-0.167 (0.065)**
D.yf _t	0.023 (0.494)
Constant	0.026 (0.010)**

Table 2: Exchange Rate Pass-Through (Real Exchange Rate)

Variables	Coefficient Estimates
D.reer _t	0.057 (0.029)*
D.reer _{t-1}	0.019 (0.030)
D.reer _{t-2}	-0.003 (0.030)
D.pf _t	0.961 (0.076)***
D.pf _{t-1}	0.174 (0.082)**
D.pf _{t-2}	-0.143 (0.072)*
D.yf _t	0.443 (0.507)
Constant	0.007 (0.006)

Notes: Standard errors are in parenthesis. * p < 0.10, ** p < 0.05, *** p < 0.01. D is the first difference operator.

Another important finding of the study shows that the main effect of the currency depreciation is on the firms' export revenues in Turkish liras. Overall, these results suggest that firms that have decreased their foreign currency-denominated export prices to some extent both gain a partial competitive advantage and have their profitability benefit from higher Turkish lira-denominated revenues. Such findings are in line with the findings of Demiroğlu (2019) that examines the impact of currency depreciation on an average Turkish exporter through its cost and financing structure and concludes that firms increase their profits in local currency after an increase in the exchange rate.

When the export price model is estimated with the real exchange rate (reer) that takes into account domestic and international price differentials instead of the nominal exchange rate, the pass-through coefficient estimate decreases from 0.11 to 0.06 (Table 2)². In other words, a 10% real depreciation in TL leads to a 0.6% decrease in US dollar-denominated export prices. Consistent with previous findings, world export prices are the main determinants of Turkey's export prices.

The regional and sectoral composition of exports appears to be a factor that limits the pass-through. The fact that the sectoral composition of exports to EU countries is composed of relatively high capital-intensive products with higher import content may cause world export prices to be more influential in firms' pricing behavior than exchange rates. On the other hand, the reliance on imported inputs of leading exporting industries in Turkey, such as automotive, basic metals and chemicals, may also limit the flexibility of firms on export prices. Taking into account domestic supply chains of firms, Akgündüz and Fendoğlu (2019) recently provided evidence that firms with higher import dependency, either directly or indirectly through their suppliers, have lower competitive pricing flexibility against a depreciation in the Turkish lira. In this context, the depreciation of the exchange rate makes firms, which use imported intermediate goods extensively in production, less able to determine export prices through the input cost channel.

Concluding Remarks

In terms of competitiveness gains, the real depreciation of a local currency allows firms to reduce foreign currency-denominated prices of the products they sell abroad, thus affecting exports on a volume basis. The exchange rate pass-through to export prices shows to what extent this mechanism can be used. Results suggest that the gradual depreciation of the Turkish lira observed since 2011 has a limited impact on foreign currency-denominated export prices, and firms mainly consider the movements in world export prices when determining the prices of their products. Although this pricing behavior limits the expansionary impact of the real depreciation of the local currency, it affects the profitability of firms positively by increasing their revenues in Turkish liras. This factor supports the investment tendency in large and exporting firms. Policies to reduce the use of imported inputs in production may increase competitiveness gains from real exchange rate movements.

References

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² Since the real exchange rate includes domestic price dynamics, the producer prices variable representing the input costs is removed from the estimation equation.