

The Prominence of the Falling Unit Labor Cost Factor in the Greek Exports Boom

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Abstract

investigates which factors led to its impressive rebound in recent years. The main findings suggest that the driving force behind the export boom was increase in price competitiveness. Furthermore, one of the determinants, namely the global demand factor, is found to have greater than expected elasticity. The evidence on domestic demand pressure on exports is inconclusive, (using as a proxy the ratio of prices of Greek internationally tradeable goods to that of non tradeables) but there is some support found to the hypothesis that increased domestic demand is negatively affecting exports.

Keywords: Greek exports, export determinants, unit labor cost, domestic demand pressure

JEL Classification: E02, E44, O16

1. Introduction

Greece has historically been a poor export performer, in contrast to the typical small open economy that traditionally relies on export growth as a key economic driver. In fact, over a period of 20 years up to the global crisis, Greek exports accounted for just 19% of GDP (2009) versus 35% for the Euro Area (Source: World Bank).

The 2009 Greek economic crisis that forced Greece to embark on a number of reforms in its economy and dramatically contain domestic demand also forced the economy to rely more on exports which however needed to be boosted by increasing competitiveness. We presumed that the latter should be primarily reflected on falling Unit Labor Costs ($ULC = \text{wage/productivity}$) versus most major trading partners, as unit labor costs are often viewed as a broad measure of (international) price competitiveness (OECD, 2023).

These economic reforms required to contain the 2009 Greek economic crisis, had a significant impact on exports. More specifically, the Greek exports quickly reacted positively to the reforms, increasing to 25.49% in 2011 (from 21.8% in 2010) and reached to 38.99% of GDP

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across several economic sectors in 2018 and 40.11% in 2019 respectively. In 2020 due to Covid as expected there was a drop to 32.06% while the most recent result is an all time high of 49.13% in 2022. It is worth noting that Greek exports accounted on average 12.2% during the 1970s rising to 17.54% during 1980s. In the next decade (1990s) average exports declined to 15.28% of GDP, while in the 2000's they bounced back to 21.32%.

In comparison to Greek exports' performance, the Euro area countries while showing a similar increasing trend in the last 50 years, they were significantly higher with averages of 21.33% in the 1970's to 36.34% in the 2000's. Given the reforms in the Greek economy, while the Greek exports were still below the Euro area performances, since 2018 the gap has decreased dramatically dropping to single digits, given that Euro area exports accounted for 55.11% of the GDP in 2022, with Greek ones being at 49.13%. It is worth noting that between 1994 and 2017, the difference was approximately 13.36 units. (World Bank, n.d.).

The aforementioned shift in performance, and the closing of the gap between Greece and the rest of the EU fellow member states with respect to the exports performance, aside from being an indicator for the effectiveness of the reforms initiated due to the 2009 Greek economic crisis, also led to be a key inspiration for developing this paper and investigating its key research questions that concern export determinants.

The scope of our research in this paper, is to examine the impact of improved competitiveness on export performance. This will be implemented by examining the relation of Greek goods exports to three key export determinants, namely the weighted relative unit labor costs (ULC hereafter), the real GDP of key trading partners and the price ratio of Greek tradeables to the price of non-tradeables. Finally, this paper aims to enlighten the cause that led to the recent Greek export boom.

2. Literature Review

Literature specific to Greek exports examined the significance of a variety of determinants of exports volume including the ones that are the focus of this study. Maroulis (1992) makes the case that since Greece is a small open economy (SOE) and thus can't affect global prices, they are price takers. So when Greece can meet international prices, exporting becomes a matter of its own supply. Therefore, he introduces the concept of the country productive capacity and highlights the ratio of price of internationally tradable goods and services to that of non tradables as a factor of the willingness to supply, with productive capacity switching to exports when the ratio of prices is favorable. The gradual reduction and finally total extermination of the overvaluation of the real effective exchange rate (REER) is set as the main prerequisite towards achieving more exports. This is only allowed by the extremely expansionary macroeconomic policy and in particular by the huge deficits of the public sector and the consequential surpluses in the capital account. One of the limitations of Maroulis (1992) is that it did not include the price ratio of tradables to non tradables as a variable in the exports supply equation. Instead the equation was focused around the REER based on relative ULCs. Chisiridis and Panagiotidis (2017) also prove the significance of the REER and of the country productive capacity as an export determinant.

Unit labor costs are often viewed as a broad measure of (international) price competitiveness. They are defined as the average cost of labor per unit of output produced. They can be expressed as the ratio of total labor compensation per hour worked to output per hour worked (labor productivity). This indicator is measured in percentage changes and indices (OECD, 2023).

Ever since the Second World War, the Greek economy makes a perfect example of the absolute application of the ‘Dutch Disease’ problem, as usually happens with emerging economies (Maroulis, 1986; Maroulis, 1992). The term Dutch Disease refers to the apparent causal relationship between the increase in economic development of a specific sector and the decline in other sectors, usually manufacturing and agriculture (Corden, 1984). In the Greek example of the Dutch disease, the capital inflows that ultimately lead to the direct and indirect deindustrialization used to be mainly shipping industry surpluses and immigrant remittances in the past, while for more recent years the booming sector is tourism along with the shipping surpluses. The problem is made worse by excessive lending and expansionary fiscal policies. In a nutshell Greece has historically consumed much more product that was domestically generated.

This chronically inflated domestic demand made for a bad environment for exporters. The infrastructure and exports’ supports mechanisms was left underdeveloped. More importantly it created a favorable ratio for the price of non internationally tradable goods and services to that of tradables, so Greek business was disincentivized to focus on exports. Maroulis (1992) also attributes the chronic fragmentation of Greek business to small entities to this favorable ratio of prices. It affords them to stay small but independent and bigger size, either through mergers or acquisitions, in order to be able to produce closer to the efficient scale, in lack of a big enough internal market, is seen as an unwarranted risk.

Malliaropoulos and Anastasatos (2013) state that sectors of the Greek economy that can conceivably export part of their production do not do so, and attribute this partly to the favorable price ratio of non-tradables to tradables. But they fail to include this ratio of prices in an exports equation.

Zilberfarb (1980), in a non Greek economy context, notes the controversy both on the theoretical and empirical level when it comes to using a proxy variable for domestic demand pressure (DDP) in an exports supply equation. With some arguing that it doesn’t affect exports in the short term and others noting that it does through its effect on domestic prices thus an exports supply equation that includes a relative price variable should not have an additional explanatory variable that measures domestic demand pressure. But, a different approach argues that domestic demand has a direct effect on exports and not just an indirect influence through the price effect.

Perhaps the only case where an additional price variable for domestic demand pressure has been used can be found in Anastasiadis (1992). In particular, in the forecasting model for Standard and Poors where an additional price variable for DDP is included, specifically the ratio of prices of tradables to non tradables.

On other export determinants, there is universal agreement in the literature (Arora & Vamvakidis, 2006; Arora & Vamvakidis, 2004; Benedict et al., 2022; Maroulis, 1992; Chisiridis & Panagiotidis, 2017) that a change in the income of a country's trading partners affects the country's exports in a very significant way. That holds true for bigger or smaller economies alike and specifically for Greece. The external demand determinant for Greek exports is included in the econometric model of this study as a control variable given the aforementioned literature findings.

Based on the key findings of the relevant literature and the scope of this paper as discussed in the introduction section, through the use of OLS regression estimation the following three main hypotheses will be tested:

H1: There is an inverse relationship between the Greek Goods' Export Volume and the ratio of Greek Unit Labor Costs to that of its main competitors.

H2: Greek Goods' Export Volume is positively related with External Demand.

H3: There is a positive relationship between the Relative Price of Greek tradeables to that of non tradeables and Greek Goods' Export Volume.

3. Data and Methodology

The dataset of this study comprises of 20 annual observations between 2003 and 2022. The Exports Volume as well it's determinants have been calculated using Eurostat and World Bank databases as sources. The following table (Table 1) presents an outline of these variables while the following section presents in detail their definitions and rationale.

Table 1: OLS model variables, symbols and Sources.

Variables	Symbol	Source
Greek Goods' Export Volume	VOLExp	World Bank
Weighted Relative ULC	ULCratio	Eurostat
Real Global GDP	RGDPglobal	World Bank
Price Ratio for Greek tradeables	Pratio	World Bank

VOLExp: Greek goods' export volume, is in 2015 real billion USD. We decided to go with goods only (as opposed to total exports of goods and services) as there is common practice to exclude exports from shipping services, as they are generated abroad and obey different laws, often of cyclical nature, that distort the picture. That said, findings that stem from goods' exports analysis, may partly apply to internationally tradable services like tourism and may apply perfectly to other such sector services like software engineering, call centers, etc.

ULCratio: Weighted relative ULC of Greece / weighted ULC of main competitors (*Italy, Spain, France, Netherlands, Germany, Russia*). This variable acts as a

proxy for how Greek prices compare to those of main competitors. It is calculated by dividing the ULC of Greece by a weighted average ULC of the identified competitors. We assigned the same weight to each competitor, because they appear to compete for roughly similar sizes of Greek exports. They are either similar size economies competing for similar percentages, bigger that compete with a smaller portion of Greek exports or smaller that compete for a larger portion,

thus eventually competing with Greece for similar size of exports. This is by definition arbitrary and has some advantages and disadvantages compared to other methods. It is the proxy for how Greek prices compare to those of main competitors.

RGDPglobal: Real global GDP is in 2015 real billion USD and is a proxy for external demand for Greek exports.

Pratio: This variable is the price ratio of Greek tradeables to the price of non tradeables and it is computed it by dividing the price of tradables to that of non tradables. For the tradables this is the price of exports, which is $P_{exp} = \text{Exports in real USD} / \text{Exports in nominal USD}$. For the price of non tradables a good proxy is the Greek GDP deflator. This is $GDP_{deflator} = \text{GDP in real USD} / \text{GDP in nominal USD}$. Anastasiadis (1992), computes this using the same formula. Pratio is a proxy for domestic demand ‘easing’ of pressure, as the price that reflects DDP (the price of non tradables) is on the denominator of this ratio. We would therefore expect the ratio to be positively correlated to more exports.

In order to examine the main hypotheses, the following regression equation has been created and estimated using the above variables, where Exports Volume is the dependent variable and the Weighted Relative ULC, Global Real GDP and Price Ratio the independent ones respectively.

$$\log(VOL_{exp}) = b_0 + b_1 \log(ULCratio) + b_2 \log(RGDP_{global}) + b_3 \log(Pratio) \quad (\text{Equation 1})$$

The aforementioned variables were used in logarithmic form in the regression model seen above. This is due to the fact that logarithms work better when bigger numbers are involved (like the global GDP) and because by using the logarithms the coefficients returned by the regression approximate the elasticity of each variable. This methodological approach is consistent with the relevant literature such as: Maroulis (1992), Anastasiadis (1992) and Chissiridis and Panagiotidis (2017).

4. Results & Discussion

The econometric presented in the previous section has been estimated using OLS estimation (similar methodology to Chissiridis, 2017). The relevant robustness checks have been performed and there where no issues found. The OLS estimation results can be seen in Table 2 that follows:

Table 2: OLS Estimation results for the main econometric model.

Model Estimated: $\log(VOL_{exp}) = b_0 + b_1 \log(ULCratio) + b_2 \log(RGDP_{global}) + b_3 \log(Pratio)$

	Estimate	S.E	t-stat	p-value
b₀	-7.480	0.339	-22.012	0.000
b₁	-0.522	0.233	-2.239	0.039
b₂	1.833	0.070	26.111	0.000
b₃	0.237	0.181	1.313	0.208
R²	0.983			
N	20			

The results of the OLS estimation show that the relationships between Exports' Volume and Relative ULC and Global GDP respectively are both found to be statistically significant, which confirms the respective research hypotheses H1 and H2. In particular, with a t-stat of -2.239, the inverse relationship between Exports' Volume and Relative ULC has been found to be statistically significant where the relative coefficient has been estimated to be equal to -0.522. Similarly the Global GDP has been found to be positively related with Greek Exports' Volume with a coefficient estimate of 1.833 and a corresponding t-stat of 26.111. Finally, the relationship between Exports' Volume and Price Ratio has been found positive, with a coefficient of 0.237, but not statistically significant (t-stat 1.313).

As seen in the previous section, most of the Exports' determinants have been found to be having a statistically significant impact. In particular we have that:

H1: The ratio of Greek Unit Labor Costs to that of its main competitors is **negatively** and significantly correlated to the export volume of Greek goods.

Our result indicates that for every 1% reduction of the ratio of Greek costs to that of their main competitors, there is a 0.52% increase in Greek goods exports, so as we become cheaper to produce relative to our main competitors, our export volume rises. Findings are consistent with Chisiridis et al. (2017), who find elasticity for REER to be -0.62. However Anastasiadis (1992), using a different set of data than both us and Chisiridis, finds a larger than 1 coefficient.

The effect of relative ULCs would likely be much more pronounced if we could source ULCs data specifically on the exporting sector. That is because as Malliaropoulos (2013) notes, the ULCs of the public sector (which produces non tradeables) remains much higher and distorts the overall ULC. Also, Anastasatos and Malliaropoulos (2011) find that 70% of the loss of price competitiveness between 2000 and 2009 is due to sectors that produce non-tradeables. Useful as it is for discussion, we could not apply these numbers on our data and use that in our regression since we don't have them for our entire sample.

H2: We find a **positive** and very **significant** correlation between external demand and Greek goods exports.

Results are consistent with both Anastasiadis (1992) and Chisiridis et al. (2017). For every 1% change in world income, there is a 1.83% increase in Greek exports. But Anastasiadis finds a much smaller elasticity at 0.79 (exports inelastic to increase in partners' income). For the reasons mentioned above our number is likely an overestimation.

H3: We find a positive, as expected, relationship between the relative price of Greek tradeables to that of non tradeables and goods' exports, but it is not significant in the 5% level (p-value of 0.21). In the relevant literature, Anastasiadis (1992) finds a positive and significant relationship.

Despite the distorting factor of public sector ULCs (which likely means that the significance of this variable would likely be somewhat higher), the divergence in both the estimate for this variable and its significance compared to Anastasiadis could be attributed to meaningful factors:

Divergences in prices of tradeables to non tradeables before 1992 could be a bigger factor because the exporting sector was smaller yet and a bigger percentage of exports were carried

out by firms that cared primarily to domestic demand. Additionally, Euro zone participation possibly limits the extent to which price of non tradeables can differ from that of tradeables, as well as limits the scope of non tradeables. Medicine distribution, lawyer services, education, energy and construction are prime examples of sectors where a common currency and common competition laws encourage the flow of both external demand and competition, which turn those sectors to 'semi-tradeables' compared to the past.

Also, for reference we have to include the results of the regression if only one price variable is used. If we omit the Pratio and only use the VOExp (besides the global demand), the coefficient for $\log(\text{VOExp})$ is -0.62 (exactly what Chissiridis finds) and it becomes more significant (t statistic: -2.76). If on the other hand we omit the ULC variable and only include the Pratio (besides global demand), we get a coefficient for $\log(\text{Pratio})$ equal to 0.37 with a t-statistic of 1.94. Not significant at the 5% significance level but significant at the 10% level (P value=0.06859). The results and significance of the intercept and of $\log(\text{RGDP}_{\text{global}})$ remain almost completely unchanged.

The above discussion again hints at the existence of at least some multi-collinearity between our 2 price variables. In turn, that means that our main regression model may be attributing a slightly smaller role in either of the two variables because part of its effect is attributed on the other. The results when only one price variable is included serve then to present the upper limits for the possible fluctuations in goods exports these variables explain. It is likely that the correct coefficients and significance for both variables range between those found in the model with all variables (lower limit) and those found in regressions with only one price variable.

It is worth repeating though that this is based on the specific set of data. More accurate data, especially on ULCs (excluding the distorting effect of ULCs of non tradeables) would likely boost the coefficients and significance of both price variables.

5. Conclusions

Our study has found an inverse relationship between Exports and relative ULC's and positive relationships between Exports and Real GDP and Price Ratios. These findings are in general consistent with the relevant literature as previously discussed. Implications of these results indicate that the improvement of Greek competitiveness as evidenced on its Real Effective Exchange Rate based on relative Unit Labor Costs, played a significant part on the Greek goods export rebound after 2012. Coupled with the effect on relative prices, we find a direct link between the government running large deficits and the decrease in exporters ability to compete in the international arena. Post the 2010 economic crisis, Greek literature agrees with the main findings of our study. In particular that Greek macroeconomic policy should be formed with competitiveness of the tradeables sector in mind. Furthermore, fiscal deficits should be kept in check, wage increases should not be greater than productivity increases. The problems that domestic demand pressure introduces have been identified and the need for further structural reforms has been highlighted.

There are two risks associated with country policy that can be identified. First risk relates with Greece having a worrisome track record in reducing debt through repayment, it has either done

so through debt-forgiving schemes or through inflation. But with Greece on the cusp of achieving investment grade credit rating for the first time since the economic crisis, the capital inflows may have an outsized effect for an economy the size of Greece. In this otherwise positive scenario one of the few tools the country will have to avoid appreciation of the REER will simply be to substantially reduce debt. The second risk refers to the preferential treating of at least some non tradable services, those of the public sector, seems to persist. There is less evidence that the political establishments understands that problem, let alone try to fix it.

With that noted, the optimistic (positive) aforementioned, scenario seems more likely and based on that, sectors where one can: import technology and knowhow; take advantage of cheap labor; and rapidly increase productivity; offer good business potential. Such sectors include agriculture (especially greenhouses), live-stock farming and internationally traded services like call centers, software engineering and tourism. Services can take advantage of a well-educated population (Greece sports the highest percentage of tertiary education as a percentage of corresponding age among the 27 countries of the European Union and at more than double the 27 countries average) and demand for them is less price sensitive compared to goods.

A second implication related with our findings is that the former fragmentation of Greek business should offer business opportunities in most sectors (manufacturing, agriculture, tourism). As the preferential treating of non tradables seems to fade away with time, it is likely that a lot of business entities (often down to family business) that used to rely on favorable internal prices were left complacent and mismanaged and are thus underperforming their profit potential. They can be acquired in a significant discount.

Another implication is that global demand is significantly and highly correlated to the Greek goods exports boom. However, if the elasticity of Greek goods exports to global demand is as high as we found this presents the risk In the case of a global slowdown for sectors like manufacturing and agriculture. Since we suspect that in reality this elasticity is lower, sector specific research becomes very important, in order to put the true risks in correct context and not to inhibit business when the risk is warranted. Finally, Sector-specific research in those sectors that we identified as ‘semi-tradables’ appears very promising and likely to uncover business opportunities.

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