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Import Impact of Economic Growth on Regional Economies

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Abstract. Paper empirically analyzes impact on regional GDP per capital of increased import volume and sophistication level, as it is often argued that these two factors can lead to reduced income level. Impact is analyzed over ten years' time period in several European countries. In contrary to popular belief, results show positive effect of those two factors on regional GDP per capita, which did not suggest import substitution, but can be as a result of complementary or intra-firm trade.

Keywords: regional economies, international trade, Europe

1. Introduction

Paper analyzes effects of increased import competition from European Union (EU) countries and outside countries on European regional GDP per capita in during one decade - from year 1995 to 2005. It is often argued that increased trade volume and import sophistication results in reduced income level. Increased import sophistication could lead to decrease of residents' income due to more competitive products produced overseas, which reduces demand for local products. This paper contributes to previous studies in such a way as it deals with previously not researched EU-wide import assessment on regional GDPs per capita. Import sophistication is analyzed lowest possible regional level NUTS2.

Quality measurement method used in this paper is average unit value (AUV), which is calculated as total sales value divided by total quantity measurement. Theoretical basis for the usage of unit value as a quality measure has been discussed by Stiglitz and Borin [7,2]. Stiglitz discusses quality and price implications by arguing that price carries information about product quality as there is information asymmetry between producers and consumers [7].

Further, Borin discusses dual impact of increase in quality on prices – higher quality means higher price, which has negative impact on demand, but higher quality also increases marginal consumers utility and thus also have positive impact on demand [2]. Dulleck analyzes export quality upgrading in Central and Eastern European countries by using unit values [3]. Aiginger splits industries into low unit value and high unit value and values are compared with Germany's trade partners [1]. Hakura does extensive US industry sector level analysis of impact of both export and import trade prices [4].

Alternative measurements are based on exporting countries average income level. Lall mentions such factors as R&D, process innovation, production capabilities, marketing, customization of products and control over distribution channels [5]. In case of Japan, Tomiura reports impact of declining import prices on local employment, depending on industry's exposure to imports [8]. Sasaki similarly reports substantial decline of employment in labor intensive industries, which were exposed to sever import competition [6].

Advantages of using AUV arise from ease of calculation and consistency over the years. Disadvantages of using AUV is that it might reflect changes in product composition in trade statistics, not changes in prices of individual product. Decrease in AUV might suggest increased production efficiency at lower costs and therefore prices [1,3].

2. Data and model

The study utilizes *Eurostat* international trade statistics and regional economies database. There are 73 305 observations collected from year 1995 to year 2005, inclusive. Random effect panel analysis is considered over fixed effects following Hausman test. The results are heteroskidasticity and auto-correlation consistent.

There are several limitations, such as EU export analysis is not included and price elasticities are not estimated. Since data about regional import values and quantities were not available, regional import value and quantity was assumed to be proportional to region's GDP share in the country's GDP.

In detailed analysis, such external trading partners were selected as US, China, Turkey, Japan, Brazil and Korea. From EU member countries Germany, United Kingdom, Netherlands and France were selected as overall biggest import partners of other EU member states.

All trade and variables are expressed in real terms and denominated in euro. In Equation 1, subscript *r* indicates region of the country *c*, whereas industry is *j*. Subscript *rt* indicates value for region *r* at time *t*, similarly subscript *jrt* - value for regional industry *j* of region *r* at time *t*. For variables at country level, subscript *c, t* indicates value of country *c* at time *t*.

$$\ln GDP_{rt} = \alpha_o + \alpha_1 \ln IIA_{jrt} + \alpha_2 \ln SCL_{jrt} + \sum_{p=1}^{k} \beta_1 \ln IM_{pjt} \frac{GDP_{rt}}{GDP_{ct}} + \varepsilon_{jrt} \quad (1)$$

Further, to test AUV impact on regional GDP per capita, Equation 2 is used, where import *IM* is replaced with *AUV*, but share in country's trade is not calculated.

$$\ln GDP_{rt} = \alpha_o + \alpha_1 \ln IIA_{jrt} + \alpha_2 \ln SCL_{jrt} + \sum_{p=1}^{k} \beta_1 \ln AUV_{pjt} + \varepsilon_{jrt} \quad (2)$$

Dependent variable is the GDP per capita in real value terms in region *r* at time *t* for all specifications. Explanatory variables are intra industry concentration (IIA), which characterizes industry concentration in terms of employment, and average number of employees at registered companies (SCL). Import value is captured with variable *IM*, where subscript *p* indicates import partner country and *k* is number of import partners observed.

All variables are observed on yearly basis and logs have been taken from all of them. Nominal values have been corrected for changes in harmonized CPI with basis 100 at year 2005. Included error term ε captures all other effects on regional GDP.

3. Results and conclusions

Specifications (1) - (3) analyzes impact of trade volume and (4) – (6) analyzes impact of trade sophistication. In more detail, (1) and (4) analyzes impact of import from major trade partners, (2) and (5) - impact of aggregate import from inside EU and outside EU and (3) and (6) – impact from major inside trade partners.

Agglomeration index IIA has negative sign across all specifications, which indicates negative effects of industry concentration on income p.c. That is regions that specializes in specific industry did not contribute positively to income. In the case of SCL index, positive sign is reported, which suggest large scale companies contribute positively to GDP per capita.

In case of bilateral trade, European countries showed positive impact of import value with exception of import from Germany. In the case of import sophistication, UK showed negative results, whereas import sophistication from Germany was insignificant.

For total EU import value, it is observed that intra-EU trade value has positive impact on manufacturing employment - specifications (1) and (4), but negative for specification (5). Contrary, AUV increase in intra-EU trade will have negative effect on income. One of the reasons for such situation could be that EU imports more raw materials (inputs), intra-firm traded products from outside, but in intra-EU trade more similar products are traded.

Looking into the specification (3), with bilateral import variables for intra-EU trade and aggregate extra EU trade, it is observed that for trade value outside EU import contributed positively, whereas import from Germany was insignificant. Import impact from UK turned negative.

As for import sophistication, signs are consistent across all specifications (4) – (6). Germany, Netherlands, France, China and Korea show positive sign and significance. In contrast, results for UK, US, Turkey and Brazil are negative and significant, suggesting that sophistication/quality improvements in import have negative effect. UK and US have high income level if compared with that of average EU, which excludes price competition, but could be quality or sophistication competition. In addition, results from trade volume suggest positive results in trade with US, UK and Brazil, which could be intra-firm trade.

4. References

[1] Aiginger, Karl. The use of unit values to discriminate between price and quality competition. *Cambridge* Journal *of Economics*, 1997, Vol. 21, pp. 571-592

[2] Borin, Alessandro, Marco Lamieri and Intesa Sanpaolo. Estimating Product Quality in International Trade, 2008. http://mpra.ub.uni-muenchen.de/14678

[3] Dulleck, Uwe, Neil Foster, Robert Stehrer and Julia Woerz. Dimensions of quality upgrading. Evidence from CEECs, *Economics of Transition*, 2005. Vol. 13 (1), pp. 51-76

[4] Hakura, Dalia. The Impact of Trade prices on Employment and Wages in the United States. International Monetary Fund Working Paper No. 97/116. 1997. http://www.imf.org/external/pubs/ft/wp/wp97116.pdf

[5] Lall, Sanjaya, John Weiss and Jinkang Zhang. The 'Sophistication' of Exports: A New Measure of Product Characteristics. QEH Working Paper Series. 2005. http://www3.qeh.ox.ac.uk/RePEc/qeh/qehwps/qehwps123.pdf

[6] Sasaki, Hitoshi. Import Competition and Manufacturing Employment in Japan. Bank of Japan Working Paper Series, November 2007. http://www.boj.or.jp/en/type/ronbun/ron/wps/data/wp07e25.pdf

[7] Stiglitz, E. Jospeh. The Causes and Consequences of the Dependence of Quality on Price. *Journal of* Economic *Literature*. 1987. Vo. 25 (1). pp. 1-48

[8] Tomiura, Eiichi. The Impact of Import Competition on Japanese Manufacturing Employment. *Journal of the Japanese and International Economies*, 2003. Vol. 17, pp. 118–33

5. Appendix

Table 1: Random effects model estimation

	Value	*Value*	*Value*	*AUV*	*AUV*	*AUV*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Intercept	7.5235[a] (0.0837)	7.2451[a] (0.0374)	9.5881[a] (0.0162)	9.5563[a] (0.0125)	9.8099[a] (0.0118)	9.5881[a] (0.0163)
Ln SCL index	*0.0482*[a] *(0.0072)*	*0.1109*[a] *(0.0029)*	*0.0331*[a] *(0.0078)*	*0.0411*[a] *(0.0054)*	*0.1386*[a] *(0.0032)*	*0.0328*[a] *(0.0078)*
IIA index	*-0.0796*[a] *(0.0061)*	*-0.1043*[a] *(0.0031)*	*-0.0454*[a] *(0.0064)*	*-0.0533*[a] *(0.0046)*	*-0.1063*[a] *(0.0033)*	*-0.0455*[a] *(0.0064)*
EU intra		-0.0098[a] (0.0033)			-0.0171[a] (0.0032)	
EU extra		0.1482[a] (0.0029)	0.0128[c] (0.0068)		0.0142[a] (0.0025)	0.0129[c] (0.0068)
Ln Germany	-0.0476[a] (0.0054)		0.0004 (0.0079)	0.0044 (0.0061)		0.0004 (0.0079)
Ln Netherlands	0.0674[a] (0.0061)		0.0306[a] 0(.0052)	0.0443[a] (0.0053)		0.0306[a] (0.0051)
Ln UK	0.0707[a] (0.0072)		-0.0302[a] (0.0061)	-0.0441[a] (0.0057)		-0.0302[a] (0.0061)
Ln Brazil	0.0178[a] (0.0033)			-0.0105[a] (0.0037)		
Ln China	0.0295[a] (0.0041)			0.0066 (0.0056)		

Ln Japan	0.0024 (0.0048)			0.0386 [a] (0.0045)		
Ln Korea	-0.0686 [a] (0.0039)			0.00848[c] (0.0051)		
Ln Turkey	0.0161 [a] (0.0031)			0.0253 [a] (0.0037)		
Ln US	0.0438 [a] (0.0051)			-0.0503 [a] (0.0055)		
R squared	0.1881	0.2333	0.0097	0.0222	0.0646	0.0097
Log likelihood	-13546.76	-18802.12	-17370.31	-16498.53	-21721.81	-17370.31

Dependent variable: log of GDP per capita in the region (1) – (6). Specifications (1)-(3) analyze impact of increase of import value share) and specifications (4)-(6) analyzes impact of increase in import average unit value (4)-(6) random effects model. Significance: a – at 1% level, b – at 5% level, c – at 10% level. Standard errors are given in parenthesis.