American Journal of Humanities and Social Sciences Research (AJHSSR)
e-ISSN :2378-703X
Volume-5, Issue-6, pp-352-369
www.ajhssr.com
Research Paper Open Access

The Determinants of Imports of Goods and Services in European Countries in the Period 2010-2019

[1]Alberto Costantiello, [2]Lucio Laureti, [3]Angelo Leogrande
[1]*Professor of Economics at Lum University-Giuseppe Degennaro, Casamassima, Bari, Italy.*
[2]*Professor of Economics at Lum University-Giuseppe Degennaro, Casamassima, Bari, Italy.*
[3] *Assistant Professor of Economics at Lum University-Giuseppe Degennaro, Casamassima, Bari, Italy.*

ABSTRACT : We estimate the determinants of imports of goods and services in 27 European Countries in the period 2010-2019 using data from AMECO with a model of 37 variables. We perform Panel Data with Fixed Effects, Panel Data with Random Effects, Pooled OLS and WLS. We found that among others, the imports of goods and services are positively associated with "*Gross National Disposable Income*", "*Compensation of Employees: Total Economy*", "*Net Saving: Private Sector*", "*Labour Share in Total Factor Productivity*". Results also show that the imports of goods and services are negatively associated, among others, with "*Exports of Goods and Services at Current Prices*", "*Harmonised Consumer Price Index*", "*Gross Capital Formation at Current Prices: Total Economy*", "*Final Consumption Expenditure of General Government at Current Prices*".

KEYWORDS: *Trade Policies; Empirical Studies on Trade; International Growth of Open Economies; International Institutional Arrangements; Economic Impacts of Globalization.*
JEL CODE*: F13; F14; F43; F55; F6.*

I. INTRODUCTION

In this article we analyze the determinants of imports of goods and services in 27 European countries[1] in the period 2010-2019. We use data from AMECO. We perform an econometric model using Panel Data with Fixed Effects, Panel Data with Random Effects, Pooled OLS and WLS. Specifically, imports are sensible in respect to the allocation of capital and labour. But imports are also determined by the presence of some macro-economic phenomena such as economic growth, inflation, exchange rates and active trade policies. Even if, on one side, it is sure that some countries have, at least for certain products, a competitive advantage to export[1] such as for example in the case of oil, on the other side many countries import due to lack of domestic productivity. But it is also necessary to distinguish among rich and poor countries in terms of imports. In effect the quality of imported products can change significantly based on a distinction between rich and poor countries. As showed in paragraph 2, many poor countries import agricultural products, while new rising countries, as for example China, import oil and other raw materials. But, in the case of rich countries the quality of imports tends to be higher in respect to poor countries. This could suggest the necessity to differentiate the empirical and theoretical analysis of imports for rich and poor countries.This consideration can be better understood in the dynamic of the relationship between the Heckscher-Ohlin theorem and the Leontief paradox.

Heckscher–Ohlin theorem and the Leontief paradox. The Heckscher–Ohlin theorem[2]is based on the idea that capital intensive economies tend to export capital-intensive goods while labour intensive economies tend to export labor intensive goods. This theorem is based on different assumptions such as the fact that the two countries are identical and there are not differences in technology, human capital, and knowledge. But this theorem was in part confuted in the 1951 by Wassily Leontief that showed that apparently U.S. exported labor intensive good and imported capital intensive goods. But, in a deeper analysis the Heckscher-Ohlin paradox still hold also in the case of Leontief paradox [3]. In effect if the researcher distinguishes labor intensive goods in

[1] Countries are Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden.

skilled intensive goods and unskilled labor-intensive goods, then U.S. export skilled labor-intensivegoods and import unskilled labor-intensive goods.

Innovation technology driven international trade theory. Since the introduction of the econometric techniques the theoretical debate about trade has changed. Specifically, authors have started to consider the role of innovation technology [4], human capital and research and development [5] as tools to promote trade. The technological advancement of some countries put them in the condition to export high-tech products and services and import low-tech products and services. In this case the suggestion for policy makers is to intervene not directly on international trade but on the human capital, Research and Development and innovation technology since these factors are able to boost the exports.
The article continues as follows: in the second paragraph contains the literature review, the third paragraph analyzes the econometric model, the fourth paragraph concludes.

II. LITERATURE REVIEW

[1] analyze the Cambodian import function in the period 1993-2015 through the application of the Autoregressive Distributed Lag-ARDL. The authors find that the Cambodian import function is negatively associated to:

- *Relative prices;*
- *Exchange rate.*

Results also show that the sequent variables have a null effect on import in Cambodian economy i.e.:

- *Foreign Direct Investment-FDI;*
- *Final consumption expenditure;*
- *Foreign exchange reserve.*

The authors suggest that if politicians are interested in stimulating imports in Cambodia, they should control domestic prices.
[2] consider the role of a imports, remittances and FDI in the economic growth of the Republic of the Fiji Islands. The authors analyze data from the period 1980-2015. Results show that:

- *Imports have a negative impact on the economic expansion in the long run;*
- *Foreign Direct Investments-FDI and remittances have a positive impact on economic growth either in the long run either in the short run.*

[3] afford the question of the relationship between trade policy and imports in South Africa in the period 1995-2012. The authors find that in the analyzed period the level of import arose significantly. Results show that trade liberalization policy has increased the level of imports in South Africa.
[4]analyze the level of imports of oil in Uganda in the period 1993-2016 using Vector Error Correction Model-VECM. Results shows that the imports of oil in Uganda either in the short either in the long run depend on three elements that are:

- *Real relative prices;*
- *Household final consumption;*
- *World oil prices.*

[5]analyze the relationship among Foreign Direct Investment-FDI, domestic investment, export, imports, labor force and economic growth in Nigeria. The authors apply the vector error correction model in the period 1981-2015. Results show that:

- *There is no relationship among the variables in the long run;*
- *In the short run there is a positive relationship between imports and economic growth;*
- *There is a positive relationship between imports and domestic investment in the short run;*
- *Exports have a positive impact on labor in the short run;*
- *Foreign Direct Investments have a positive impact on labor in the short run;*
- *There is a positive impact between labor and Foreign Direct Investments in the short run.*

[6] afford the question of the relationship among imports, exports, and economic growth in Panama. The authors use data from 1980 to 2015 with a Vector Auto Regression Model and the Granger Causality. Results show that:

- *There is no relationship among exports, imports and economic growth in Panama;*
- *There is a positive relationship between imports and economic growth;*
- *There is a positive relationship between exports and economic growth.*

The authors suggest that policy makers should consider the active role of imports and export in promoting the economic growth.
[7]afford the question of the systemic risk of oil imports in China. Oil is a strategic asset for China economics growth. Specifically, the authors consider the question of the scarcity of oil in the global oil supply chain-OSC. Four factors are considered as basic factors to improve the efficiency of the global oil supply chain i.e.:

- *Availability;*
- *Accessibility;*
- *Affordability;*
- *Acceptability.*

Availability, Accessibility and Affordability are described by the authors as endogenous risks, while Acceptability is considered as an exogenous risk. A two-dimensional matrix is applied to analyze the relationships between exogenous and endogenous risks. Results shows that in the period 2003-2013 China has faced three different typologies of risks in the Oil Supply Chain. The authors suggest improving new strategies to reduce the risks of Oil Supply Chain in China.

[8]analyze the relationship between import and exports of medical instruments in Pakistan. Data are analyzed in the application of Vector error correction estimate using time series in the period June 2003 and December 2017 through the usage of State Bank of Pakistan. Results show that there isa positive relationship between long run relationship and import and exports of medical instruments in Pakistan.

[9]afford the question of the relationship between inflation and imports in Palestine. The authors use data in the period 1996-2016 in the application of the causality test. Results shows that:

- *There is a causal relationship betweeninflation and imports.*

The authors suggest that the reduction of inflation requires the reduction of imports in Palestine.

[10]consider the impact of Nigerian productivity of goods and services on Nigerian imports. The authors use the Auto-Regressive Distributed Lag-ARDL applied to data in the period 1985-2016. Results suggest that:

- *The production of electrical and electronics are negatively associated with imports;*
- *There is no relationship between domestic oil production and oil imports;*
- *Domestic production of food and beverages have a positive impact on imports of food and beverages;*
- *There is a certain sensitivity of import to exchange rate in some domestic production even if this effect can be manifested in different times;*
- *The increase in GDP has a positive impact on imports but only for some products.*

The authors suggest that the determinants of imports in Nigeria differ among different products. And if policy makers are interested in the application of interest rates and tariffs to change the dynamic of imports they should create product-based import political economies.

[11]analyze the intensity of Burundi's rice imports from Tanzania. The authors estimate the factors that influence the intensity of rice imports from Tanzania to Burundi. The results show that:

- *The Burundian imports from Tanzania are increased in the period 2003-2018;*
- *The financial crisis of the 2007-2008 has reduced the Burundi's rice imports from Tanzania;*
- *The Burundian imports of rice from Tanzania growth with national income and trade openness.*

The ability of Burundi to improve rice's import from Tanzania is determined either by national and international economic conditions. Burundian politicians can intervene with active policies only for national determinants for example promoting GDP and trade openness. But in the case of global crisis, such that of the 2007-2008, national political economies are insufficient to sustain Burundian imports from Tanzania.

[12]analyze the determinants of the imports in Nigeria in the period 1980-2014. The authors use Ordinary Least Square and cointegration/error correction mechanism to find relations among data. Results show that:

- *Real income level, domestic price change and exchange rate have a negative impact on imports in Nigeria;*
- *Degree of openness, gross capital formation and external debt have a positive impact on imports in Nigeria.*

The authors suggest that increase in real income, trade restriction and Foreign Direct Investment-FDI can improve the ability of the Nigerian economy to better perform in the context of the international trade.

[13] afford the determinants of the import of agricultural products in Sub-Saharan Africa-SSA. The authors apply a gravity model to analyze the imports in 37 SSA countries in the period 1995-2018. Results show that the sequent elements are positively and significantly associated to imports:

- *Gross Domestic Product-GDP;*
- *Arable land endowment;*
- *Member to regional trade agreement;*
- *Cultural proximity;*
- *Inflation*
- *Governance quality.*

But, the same analysis has showed that the level of imports in South Saharan African-SSA countries are negatively and significantly associated with:

- *the growth of population in trading partners;*
- *geographical distance among trading countries;*

- *transport costs;*
- *agriculture productivity of the importing country*

The authors suggest creating a political economy based on their econometric results to improve international trade.

[14]analyze the relationship between quality of export, intermediate exports, and institutional environment. The authors analyze data from General Administration of Customs-GAC in the period 2000-2013. Results show that:

- *intermediate imports have a positive impact of product quality in four different dimensions i.e. competitions, knowledge spillover, intermediate quality, intermediate diversification;*
- *the improvement of the institutional environment has a positive impact on intermediate imports;*
- *there is a U-shaped correlation between import duration and product quality.*

The authors suggest improving the regional institutional environment to improve the quality of exports.

[15]analyze the relationship between imports and energy consumption in Turkey. The authors find that:

- *there is a positive relationship between energy consumption and imports;*
- *the positive effect of imports on energy consumption is consistent either in the short and in the long-run.;*
- *there is a significant positive relationship between energy consumption, on one side, and real income and real exchange, on the other side.*

The authors suggest that to reduce the imports of energy in Turkey it is necessary to promote new local energy sources. In this sense while the energy consumption can be considered positively as a driver of the economic growth of Turkey, on the other side the dependence from energy imports augments the output gap.

[16]consider the relationship between trade liberalization and imports of alcoholic beverages in Australia. The authors propose a longitudinal analysis of the impact of Preferential Trade Agreements-PTAs on alcohol imports. The authors consider 15 alcohol product and 16 importing countries in the period 1998-2016 based on a global database. A log-linear model has been introduced to analyze the relationship among alcohol imports, tariff levels and PTA status. The econometric model has been realized through the application of a clusterization of the Australian trading partners based on the level of alcohol consumption in the population. Results shows that:

- *the introduction of PTA is associated with an increase in Australian alcoholic beverage imports in the trading partners;*
- *tariff rate reductions is associated with an increase of imports in trading countries.*

The authors suggest promoting the diffusion of Preferential Trade Agreements- PTA to improve exports of Australian alcoholic beverage products among trading partners.

[17]analyze the degree of concentration in US imports. The authors have found a reduction in concentration among typical industry. The reduction of concentration is the effect of global changes in the international market i.e.:

- *the increasing number of exporting firms;*
- *the reduction exported products for top firms:*
- *the increasing in average revenue per product of top firms;*
- *convergence among top firms by sector;*
- *divergence among top firms in the country.*

The authors conclude that the growing competition in the global market is associated with a deeper concentration at a national level in the US economy.

[18]analyze the impact of trade agreement on food imports in the countries that participate of the Association of the Southeast Asian Nations-ASEAN in respect to harmonization of food standards. The authors afford the question of the relationship between Non-Tariff Measures-NTMs a on food imports from ASEAN.Results show that:

- *the presence of regulation policies based on technical limitations reduces the ability of Malaysia to import agricultural and food products;*
- *harmonization of food standard improves the ability of ASEAN countries to trade in the food sectors;*
- *To improve the efficacy of food trade it is relevant to promote NTMs for specific products.*

The authors sustain that the presence of a common regulation among ASEAN countries can promote the international trade in food products in the entire region also increasing food security.

[19]consider the determinants of merchandise imports in Egypt in the period 1970-2014. In the analyzed period the degree of merchandise imports in Egypt is increased by 10.64 on average. The authors use Ordinary Least Squares-OLS and the Error Correction model. Results show that:

- *There is a positive relationship between domestic demand for merchandise and GDP growth;*
- *There is a negative relationship between imports of merchandise and real effective exchange rates.*

- *In the long run there is a positive relationship between domestic demand for merchandise and inflation;*
- *In the long run there is a positive relationship between domestic demand for merchandise and international reserves.*

These findings can also inspire the policy maker to realize appropriate interventions of political economy.

[20] consider the trade policy among ASEAN Economic Community-AEC. The authors focus their attention of food and agricultural products. Trade of food has a relevant role in promoting food security among the ASEAN region. Specifically, the authors consider the determinants of Indonesian imports from ASEAN. Data are collected for the period 1990-2016 among various ASEAN countries that are Indonesian trading partners. The authors apply the gravity model and perform panel data regressions with fixed effects. Results show that Indonesian maize imports from ASEAN countries are associated to the sequent variables i.e.:

- *GDP per capita;*
- *Economic distance;*
- *Import tariffs;*
- *Exchange rate;*
- *Non tariff barriers;*
- *Degree of integration among ASEAN countries;*
- *Population growth.*

But the authors suggest to Indonesian government to promote the production of maize to reduce the food dependence from ASEAN countries.

[21] afford the question of the relationship between imports of industrial robots and firm-level outcomes. Authors use data for the period 1994-2014 collected for the French economy. Results show that:

- *Robot importers are more productive, with more qualified human capital, and larger in respect to their competitors;*
- *Robots imports is the consequence of a growth of the firm;*
- *The adoption of robots imported is associated with an increase in efficiency and a loss in employment;*
- *A demand shock improve either the usage of imported robots either employment;*
- *Exogenous technological shocks are associated to reduction in employment.*
- *There is a weak positive effect between robot imports and total sales*.

The authors suggest that the increasing in the productivity does not necessarily generate more affordable prices for consumers.

[22] analyze the relationship between income inequality, imports, and product quality. The authors find that:

- *there is a positive relationship between income inequality and lower product quality of exports;*
- *incumbent exporting firms reduce the unitarian value of product exported in countries with growing inequalities*.

The authors suggest that since income inequality tends to improve in rich countries the negative relationship between income inequality and lower quality of exported products generates an effect on the global supply chains.

[23]analyze the relationship between Intellectual Property Rights-IPR and trade among countries. The authors analyze data from 119 countries in the period 1976-2010. Results show that:

- *there is a positive impact of Intellectual Property Rights-IPR on manufacturing imports for high-tech products;*
- *the increase of one unit in Intellectual Property Rights-IPR improve of 22% the imports of high-tech manufacturing products.*

III. THE ECONOMETRIC MODEL

We estimate the sequent model:

Regressors	Label	Variables
y	**A366**	Imports of goods and services at current prices (National accounts)
x_1	**A8**	Total population (National accounts)
x_2	**A33**	Private final consumption expenditure at current prices per head of population
x_3	**A48**	Harmonised consumer price index (All-items)
x_4	**A50**	Final consumption expenditure of general government at current prices
x_5	**A62**	Individual consumption of general government at current prices

x_6	**A101**	Gross fixed capital formation at current prices: non-residential construction and civil engineering
x_7	**A105**	Gross fixed capital formation at current prices: metal products and machinery
x_8	**A109**	Gross fixed capital formation at current prices: other investment
x_9	**A136**	Gross capital formation at current prices: total economy
x_{10}	**A146**	Net national saving
x_{11}	**A150**	Net saving: private sector :- ESA 2010
x_{12}	**A167**	Final demand at current prices
x_{13}	**A199**	Gross national disposable income
x_{14}	**A205**	Gross national disposable income per head of population
x_{15}	**A214**	Gross domestic product at current prices
x_{16}	**A238**	Gross domestic product at current prices per head of population
x_{17}	**A265**	Potential gross domestic product at 2015 reference levels
x_{18}	**A278**	Contribution to the increase of GDP at constant prices of final demand :- including intra-EU trade
x_{19}	**A279**	Contribution to the increase of GDP at constant prices of imports of goods and services :- including intra-EU trade
x_{20}	**A285**	Domestic income at current prices
x_{21}	**A291**	Gross value added at current basic prices excluding FISIM: total economy
x_{22}	**A295**	Compensation of employees: total economy
x_{23}	**A298**	Taxes linked to imports and production: total economy
x_{24}	**A301**	Gross operating surplus: total economy
x_{25}	**A302**	Gross operating surplus: total economy :- Adjusted for imputed compensation of self-employed
x_{26}	**A303**	Net operating surplus: total economy
x_{27}	**A305**	Nominal compensation per employee: total economy
x_{28}	**A324**	Adjusted wage share: total economy: as percentage of GDP at current prices (Compensation per employee as percentage of GDP at market prices per person employed.)
x_{29}	**A325**	Adjusted wage share: total economy: as percentage of GDP at current factor cost (Compensation per employee as percentage of GDP at factor cost per person employed.)
x_{30}	**A338**	Net capital stock at 2015 prices: total economy
x_{31}	**A341**	Net capital stock per unit of gross domestic product at constant prices :- Capital output ratio: total economy
x_{32}	**A343**	Net returns on net capital stock: total economy
x_{33}	**A344**	Total factor productivity: total economy
x_{34}	**A345**	Labour share in total factor productivity: total economy
x_{35}	**A346**	Capital share in total factor productivity: total economy
x_{36}	**A350**	Exports of goods and services at current prices (National accounts)
x_{37}	**A391**	Terms of trade goods and services (National accounts)

We found that the level of "*Imports of goods and services*" at current prices is positively associated with:

- *Gross national disposable income;*
- *Nominal compensation per employee: total economy;*
- *Final demand at current prices;*
- *Gross operating surplus: total economy :- Adjusted for imputed compensation of self-employed;*
- *Potential gross domestic product at 2015 reference levels;*
- *Private final consumption expenditure at current prices per head of population;*
- *Taxes linked to imports and production: total economy;*

- *Compensation of employees: total economy;*
- *Individual consumption of general government at current prices;*
- *Gross fixed capital formation at current prices: other investment;*
- *Gross fixed capital formation at current prices: metal products and machinery;*
- *Gross domestic product at current prices;*
- *Net capital stock per unit of gross domestic product at constant prices :- Capital output ratio: total economy;*
- *Net saving: private sector :- ESA 2010;*
- *Labour share in total factor productivity: total economy ;*
- *Capital share in total factor productivity: total economy ;*
- *Adjusted wage share: total economy: as percentage of GDP at current prices (Compensation per employee as percentage of GDP at market prices per person employed.);*
- *Contribution to the increase of GDP at constant prices of imports of goods and services :- including intra-EU trade;*
- *Contribution to the increase of GDP at constant prices of final demand :- including intra-EU trade;*
- *Net returns on net capital stock: total economy.*

We found that the Imports of goods and services at current prices is negatively associated with:

- *Exports of goods and services at current prices (National accounts);*
- *Terms of trade goods and services (National accounts);*
- *Harmonised consumer price index (All-items);*
- *Total population (National accounts);*
- *Net national saving;*
- *Adjusted wage share: total economy: as percentage of GDP at current factor cost (Compensation per employee as percentage of GDP at factor cost per person employed.);*
- *Gross capital formation at current prices: total economy;*
- *Total factor productivity: total economy;*
- *Gross fixed capital formation at current prices: non-residential construction and civil engineering;*
- *Gross domestic product at current prices per head of population;*
- *Final consumption expenditure of general government at current prices;*
- *Gross operating surplus: total economy;*
- *Net operating surplus: total economy;*
- *Net capital stock at 2015 prices: total economy;*
- *Domestic income at current prices;*
- *Gross value added at current basic prices excluding FISIM: total economy;*
- *Gross national disposable income per head of population.*

IV. CONCLUSIONS

In this article we have estimated the determinants of imports of goods and services in 27 European Countries in the period 2010-2019 using data from AMECO with a model of 37 variables. We have introduced some of the traditional theories of international trade in the first paragraph followed by a more recent literature review in the second paragraph. In the third paragraph we have shown the results of our econometric model. We have performed different econometric model i.e.: Panel Data with Fixed Effects, Panel Data with Random Effects, Pooled OLS and WLS. We found that among others, the imports of goods and services are positively associated with "*Gross National Disposable Income*", "*Compensation of Employees: Total Economy*", "*Net Saving: Private Sector*", "*Labour Share in Total Factor Productivity*". Results also show that the imports of goods and services are negatively associated, among others, with "*Exports of Goods and Services at Current Prices*", "*Harmonised Consumer Price Index*", "*Gross Capital Formation at Current Prices: Total Economy*", "*Final Consumption Expenditure of General Government at Current Prices*".

Bibliography

[1] D. Ricardo, On the Principles of Political Economy and Taxation, London : Murray , 1821.

[2] A. V. Deardorff, «The general validity of the Heckscher-Ohlin theorem,» *The American Economic Review,* vol. 72, n. 4, pp. 683-694, 1982.

[3] W. Leontief, «Domestic production and foreign trade; the American capital position re-examined,»

Proceedings of the American philosophical Society, vol. 97, n. 4, pp. 332-349, 1953.

[4] L. L. Soete, «A general test of technological gap trade theory,» *Weltwirtschaftliches Archiv,* vol. 117, n. 4, pp. 638-660, 1981.

[5] W. H. Gruber e R. Vernon, «The technology factor in a world trade matrix,» *The technology factor in international trade,* n. NBER, pp. 233-301, 1970.

[6] C. Hor, K. Keo e C. Suttiprapa, «An Empirical Analysis of Cambodia's Import Demand Function,» *Journal of Management, Economics, and Industrial Organization,* vol. 2, n. 1, pp. 1-12, 2018.

[7] K. K. Makun, «Imports, remittances, direct foreign investment and economic growth in Republic of the Fiji Islands: An empirical analysis using ARDL approach,» *Kasetsart Journal of Social Sciences,* vol. 39, n. 3, pp. 439-447, 2018.

[8] N. P. Vacu e N. Odhiambo, «The Demand for Imports in South Africa: an Exploratory review,» *Socioeconomica – The Scientific Journal for Theory and Practice of Socio-economic Development,* vol. 5, n. 10, pp. 241-262, 2016.

[9] G. Ogwang, D. N. Kamuganga e T. Odongo, «Understanding the Determinants of Uganda's Oil Imports,» *American Journal of Economics,* vol. 9, n. 4, pp. 181-190, 2019.

[10] S. Bakari, M. Mabroukib e A. Othmani, «The Six Linkages between Foreign Direct Investment, Domestic Investment, Exports, Imports, Labor Force and Economic Growth: New Empirical and Policy Analysis from Nigeria,» *Journal of Smart Economic Growth,* 2018.

[11] S. Bakari e M. Mabrouki, «Impact of exports and imports on economic growth: new evidence from Panama,» *Journal of Smart Economic Growth,* vol. 2, n. 1, pp. 67-79, 2017.

[12] X. Sun, C. Liu, X. Chen e J. Li, «Modeling systemic risk of crude oil imports: Case of China's global oil supply chain,» *Energy,* vol. 121, pp. 449-465, 2017.

[13] F. ur Rehman, «Long Run Relationship between Exports, Imports and Its Determinants of Medical Instruments: Case of Pakistan,» *International Journal of Experiential Learning & Case Studies,* vol. 5, n. 1, pp. 014-030, 2020.

[14] S. M. Abumdallala, «The Relationship Between Imports and Inflation in Palestine: Toda and Yamamoto Causality Analysis.,» *International Journal of Business Administration,* vol. 10, n. 2, pp. 17-21, 2019.

[15] E. A. Olubiyi, F. Olaifa e R. S. Akande, «Are the Determinants of Imports Similar Across Manufactured Products? Evidence from Nigeria,» *Journal of Economics, Management and Trade,* pp. 1-17, 2019.

[16] J. C. Ndayisaba, J. K. Lagat, W. M. Ndayitwayeko e S. K. Kiprop, «Analysis of the Intensity of Burundi's Rice Imports from Tanzania,» *Asian Journal of Agricultural Extension, Economics & Sociology,* pp. 111-119, 2020.

[17] A. Nteegah e N. Mansi, «Analysis of factors influencing import demand in Nigeria,» *West African Journal of Industrial and Academic Research,* vol. 17, n. 1, pp. 88-100, 2017.

[18] E. N. Mwangi, «Determinants of Agricultural Imports in Sub-Saharan Africa: A Gravity Model,» *African Journal of Economic Review,* vol. 9, n. 2, pp. 271-287, 2021.

[19] Y. Song, Y. Wu, G. Deng e P. Deng, «Intermediate Imports, Institutional Environment, and Export Product Quality Upgrading: Evidence from Chinese Micro-Level Enterprises,» *Emerging Markets Finance and Trade,* vol. 57, n. 2, pp. 400-426, 2021.

[20] S. Katircioglu, S. Katircioğlu e M. Altinay, «Interactions between energy consumption and imports: empirical evidence from Turkey,» *Journal of Comparative Asian Development,* vol. 16, n. 2, pp. 161-178, 2017.

[21] A. Schram, E. Aisbett, B. Townsend, R. Labonté, F. Baum e S. Friel, «Toxic trade: the impact of preferential trade agreements on alcohol imports from Australia in partner countries,» *Addiction,* vol. 115, n. 7, pp. 1277-1284, 2020.

[22] A. Bonfiglioli, R. Crinò e G. Gancia, «Concentration in international markets: Evidence from US imports,» *Journal of Monetary Economics,* 2021.

[23] E. S. Devadason, V. G. R. Chandran e K. Kalirajan, «Harmonization of food trade standards and regulations in ASEAN: the case of Malaysia's food imports,» *Agricultural Economics,* vol. 49, n. 1, pp. 97-109, 2018.

[24] M. Ibrahim, « An Examination of the Merchandise Imports Demand Function for Egypt,» *Applied Economics and Finance,* vol. 4, n. 2, 2017.

[25] S. A. Purnamasari e J. H. Mulyo, «Indonesian maize imports: a gravity approach,» *IOP Conference Series: Earth and Environmental Science* , vol. 518, n. 1, 2020.

[26] A. Bonfiglioli, R. Crinò, H. Fadinger e G. Gancia, «Robot Imports and Firm-Level,» *CESifo Working Paper*, n. 8741, 2020.

[27] A. Ciani, «Income inequality and the quality of imports,» *Review of World Economics*, vol. 157, n. 2, pp. 375-416, 2021.

[28] W. Chen, «Do stronger intellectual property rights lead to more R&D-intensive imports?,» *The Journal of International Trade & Economic Development*, vol. 26, n. 7, pp. 865-883, 2017.

Appendix

Pooled OLS, using 240 observations					
Including 27 cross section units					
Time series length: minimum 8, maximum 10					
Dependent variable: A366					
	Coefficient	*Standard Error*	*t*	*p-value*	
const	−5,31083e+09	1,80761e+09	−2,938	0,0037	***
A8	−1,03085	0,441019	−2,337	0,0204	**
A33	67,2854	4,35392	15,45	<0,0001	***
A48	−0,774243	0,0903837	−8,566	<0,0001	***
A50	−21,5426	5,03689	−4,277	<0,0001	***
A62	25,2207	10,6189	2,375	0,0185	**
A101	−10,1551	2,57355	−3,946	0,0001	***
A105	17,7993	3,00164	5,930	<0,0001	***
A109	25,0018	3,79021	6,596	<0,0001	***
A136	−5,55577	1,56499	−3,550	0,0005	***
A146	−1,42586	0,400247	−3,562	0,0005	***
A150	7,03198	1,80733	3,891	0,0001	***
A167	87,8404	5,31116	16,54	<0,0001	***
A199	142,150	10,2271	13,90	<0,0001	***
A205	−170,493	13,7027	−12,44	<0,0001	***
A214	9,66254	2,77937	3,477	0,0006	***
A238	−13,0694	3,29157	−3,971	<0,0001	***
A265	68,9341	10,1002	6,825	<0,0001	***
A278	0,167426	0,0982299	1,704	0,0898	*
A279	0,258731	0,125046	2,069	0,0398	**
A285	−73,9995	14,9968	−4,934	<0,0001	***
A291	−158,174	10,6445	−14,86	<0,0001	***
A295	28,1625	2,69888	10,43	<0,0001	***
A298	43,9178	6,78484	6,473	<0,0001	***
A301	−22,5070	2,68676	−8,377	<0,0001	***
A302	87,6988	3,21173	27,31	<0,0001	***
A303	−64,2222	5,38676	−11,92	<0,0001	***
A305	139,409	12,8731	10,83	<0,0001	***
A324	1,51586	0,245801	6,167	<0,0001	***
A325	−1,50767	0,270438	−5,575	<0,0001	***
A338	−72,3582	2,76566	−26,16	<0,0001	***
A341	7,82548	1,07252	7,296	<0,0001	***
A343	0,123089	0,0403789	3,048	0,0026	***
A344	−6,89033	1,80596	−3,815	0,0002	***
A345	6,51579	1,76714	3,687	0,0003	***

A346	6,36898	1,79129	3,556	0,0005	***
A350	−0,101595	0,0306999	−3,309	0,0011	***
A391	−0,510571	0,111805	−4,567	<0,0001	***

Meandependent Variable	46040082	*Standard deviationdependent variable*	2,05e+08
Quadratic sum of residuals	1,35e+17	*Standard error of the regression*	25850469
R-squared	0,986603	*Correct R-square*	0,984149
F(37, 202)	402,0425	*P-value(F)*	1,9e-169
Log-likelihood	−4416,142	*Akaike'scriterion*	8908,284
Schwarz'scriterion	9040,549	*Hannan-Quinn*	8961,577
rho	0,028324	*Durbin-Watson*	1,369762

Fixed effects, using 240 observations

Including 27 cross section units

Time series length: minimum 8, maximum 10

Dependent variable: A366

	Coefficient	*Errore Std.*	*t*	*p-value*	
const	−3,75722e+09	1,94876e+09	−1,928	0,0555	*
A8	−1,30788	0,461312	−2,835	0,0051	***
A33	72,3295	4,92433	14,69	<0,0001	***
A48	−0,753299	0,0959135	−7,854	<0,0001	***
A50	−31,1130	5,54367	−5,612	<0,0001	***
A62	29,0471	11,2826	2,575	0,0109	**
A101	−8,05000	2,89936	−2,776	0,0061	***
A105	17,4287	3,16970	5,499	<0,0001	***
A109	21,5886	3,94982	5,466	<0,0001	***
A136	−5,27661	1,67917	−3,142	0,0020	***
A146	−1,56824	0,423956	−3,699	0,0003	***
A150	6,87439	1,93504	3,553	0,0005	***
A167	85,2878	5,69049	14,99	<0,0001	***
A199	148,259	10,8274	13,69	<0,0001	***
A205	−170,465	14,5340	−11,73	<0,0001	***
A214	11,7866	2,88985	4,079	<0,0001	***
A238	−10,4492	3,52761	−2,962	0,0035	***
A265	78,1784	11,0939	7,047	<0,0001	***
A278	0,187319	0,105275	1,779	0,0769	*
A279	0,298427	0,134515	2,219	0,0278	**
A285	−87,7450	16,3508	−5,366	<0,0001	***
A291	−162,865	11,0756	−14,70	<0,0001	***
A295	22,4746	3,07895	7,299	<0,0001	***
A298	45,0229	7,27577	6,188	<0,0001	***
A301	−19,8860	2,86343	−6,945	<0,0001	***
A302	86,9112	3,67136	23,67	<0,0001	***
A303	−57,1878	5,81766	−9,830	<0,0001	***
A305	134,868	13,7763	9,790	<0,0001	***
A324	1,77874	0,264420	6,727	<0,0001	***
A325	−1,71986	0,287758	−5,977	<0,0001	***
A338	−69,2869	3,27207	−21,18	<0,0001	***
A341	9,48825	1,20215	7,893	<0,0001	***
A343	0,0933592	0,0446314	2,092	0,0379	**

A344	−5,00732	1,95739	−2,558	0,0114	**
A345	4,70153	1,91488	2,455	0,0151	**
A346	4,70077	1,93386	2,431	0,0161	**
A350	−0,0856749	0,0330307	−2,594	0,0103	**
A391	−0,522423	0,114580	−4,559	<0,0001	***

Dependent variable mean	46040082	*Standard deviationdependent variable*	2,05e+08
Quadratic sum of residuals	1,17e+17	*Standard error of the regression*	25741967
R-quadro LSDV	0,988425	*Intra-group R-picture*	0,987629
LSDV F (63, 176)	238,5546	*P-value (F)*	5,1e-143
Log-likelihood	−4398,599	*Akaike'scriterion*	8925,197
Schwarz'scriterion	9147,958	*Hannan-Quinn*	9014,954
rho	−0,114756	*Durbin-Watson*	1,676495

Joint regressor test -

Test statistics: F(37, 176) = 379,745

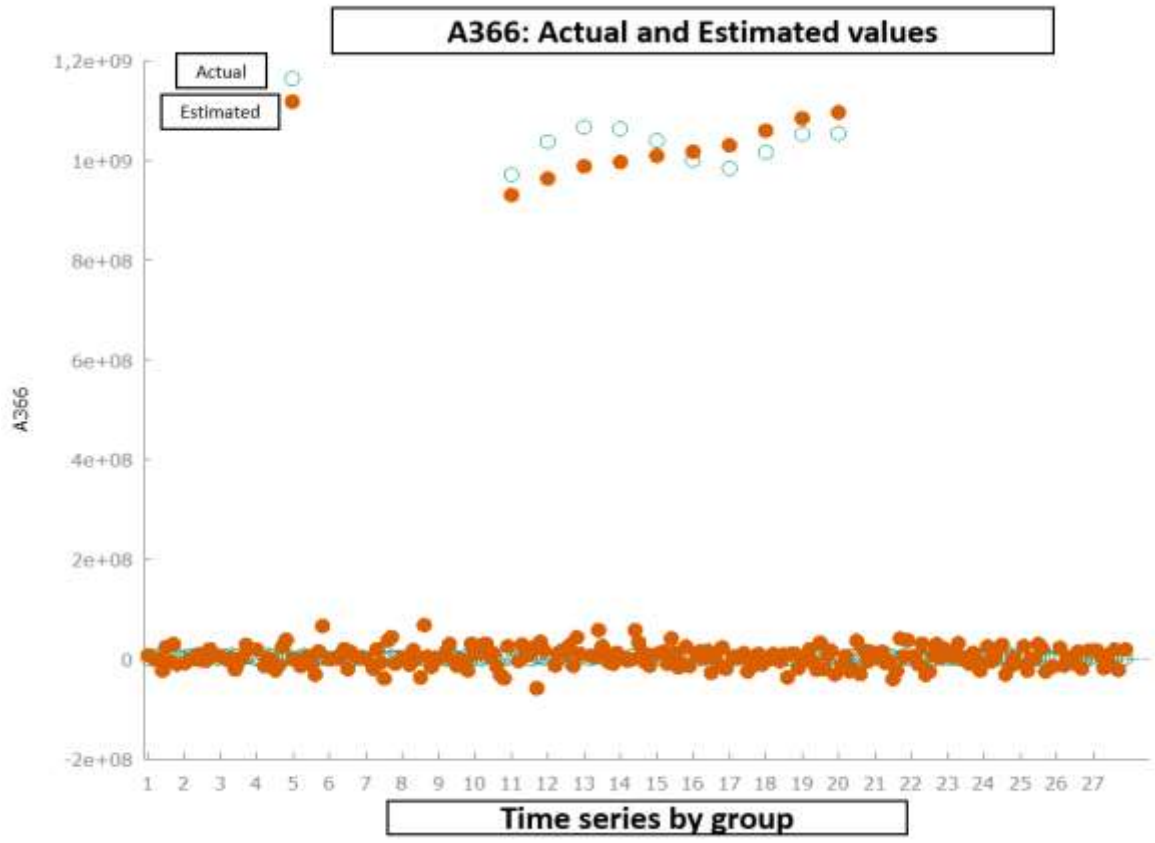
p-value = P(F(37, 176) > 379,745) = 4,37423e-149

Group Intercept Difference Test -

Null hypothesis: groups have a common intercept

Test statistic: F (26, 176) = 1.06563

with p-value = P (F (26, 176)> 1.06563) = 0.386466

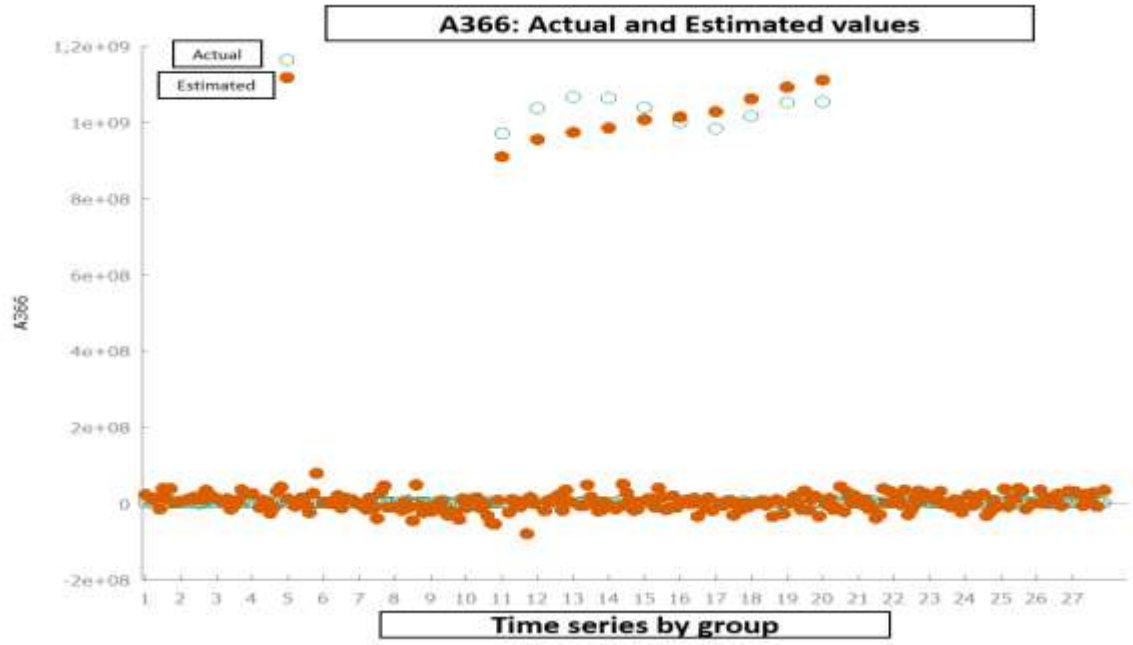


Random Effects (GLS), using 240 observations					
With transformation of Nerlove					
Including 27 cross section units					
Time series length: minimum 8, maximum 10					
Dependent variable: A366					
	Coefficient	*Std.Error*	*z*	*p-value*	
const	−4,59372e+09	1,81536e+09	−2,530	0,0114	**
A8	−1,18981	0,435506	−2,732	0,0063	***
A33	69,4705	4,49810	15,44	<0,0001	***
A48	−0,761100	0,0904690	−8,413	<0,0001	***
A50	−27,1363	5,14240	−5,277	<0,0001	***
A62	27,9970	10,6350	2,633	0,0085	***
A101	−9,42455	2,64647	−3,561	0,0004	***
A105	17,8868	2,98678	5,989	<0,0001	***
A109	23,0054	3,73379	6,161	<0,0001	***
A136	−5,27093	1,57502	−3,347	0,0008	***
A146	−1,49494	0,400329	−3,734	0,0002	***
A150	6,80491	1,81786	3,743	0,0002	***
A167	86,0082	5,34953	16,08	<0,0001	***
A199	146,660	10,2160	14,36	<0,0001	***
A205	−171,853	13,6886	−12,55	<0,0001	***
A214	10,8894	2,74107	3,973	<0,0001	***
A238	−11,9099	3,27523	−3,636	0,0003	***
A265	73,7211	10,2406	7,199	<0,0001	***
A278	0,175293	0,0990039	1,771	0,0766	*
A279	0,277477	0,126352	2,196	0,0281	**
A285	−82,3939	15,2271	−5,411	<0,0001	***
A291	−160,881	10,5049	−15,31	<0,0001	***
A295	25,1857	2,79421	9,014	<0,0001	***
A298	43,9914	6,82837	6,442	<0,0001	***
A301	−21,1616	2,68302	−7,887	<0,0001	***
A302	87,0549	3,33568	26,10	<0,0001	***
A303	−59,9547	5,44657	−11,01	<0,0001	***
A305	138,472	12,8973	10,74	<0,0001	***
A324	1,66603	0,247909	6,720	<0,0001	***
A325	−1,63512	0,271169	−6,030	<0,0001	***
A338	−70,9286	2,90118	−24,45	<0,0001	***
A341	8,63919	1,10186	7,841	<0,0001	***
A343	0,111298	0,0411550	2,704	0,0068	***
A344	−5,99800	1,81813	−3,299	0,0010	***
A345	5,66917	1,77836	3,188	0,0014	***
A346	5,58515	1,79980	3,103	0,0019	***
A350	−0,0964339	0,0308232	−3,129	0,0018	***
A391	−0,518055	0,109253	−4,742	<0,0001	***
Dependent variable mean		46040082	Mean square deviation of the dependent variable	2,05e+08	
Quadratic sum of residuals		1,41e+17	Standard error of the regression	26326038	

	Log-likelihood	−4421,110	Akaike's criterion	8918,220
	Schwarz's criterion	9050,484	Hannan-Quinn	8971,513
	rho	−0,114756	Durbin-Watson	1,676495

Variance 'between' = 1.78676e + 014
Variance 'within' = 4.85943e + 014
mean theta = 0.515146
Joint regressor test -
Asymptotic test statistic: Chi-square (37) = 15441.1
with p-value = 0
Breusch-Pagan Test -
Null hypothesis: variance of unit-specific error = 0
Asymptotic test statistic: Chi-square (1) = 1.27915
with p-value = 0.258057

Hausman test -
Null hypothesis: GLS estimates are consistent
Asymptotic test statistic: Chi-square (37) = 29.0421
with p-value = 0.821773



WLS, using 240 observations
Including 27 cross section units
Dependent variable: A366
Weights based on variances of errors per unit

	Coefficient	*Std.Error*	*t*	*p-value*	
const	−4,07673e+09	1,37504e+09	−2,965	0,0034	***
A8	−0,813817	0,370469	−2,197	0,0292	**
A33	62,4983	3,50582	17,83	<0,0001	***
A48	−0,753269	0,0709523	−10,62	<0,0001	***
A50	−21,2630	4,30747	−4,936	<0,0001	***
A62	32,7127	8,58292	3,811	0,0002	***
A101	−9,76323	2,07692	−4,701	<0,0001	***

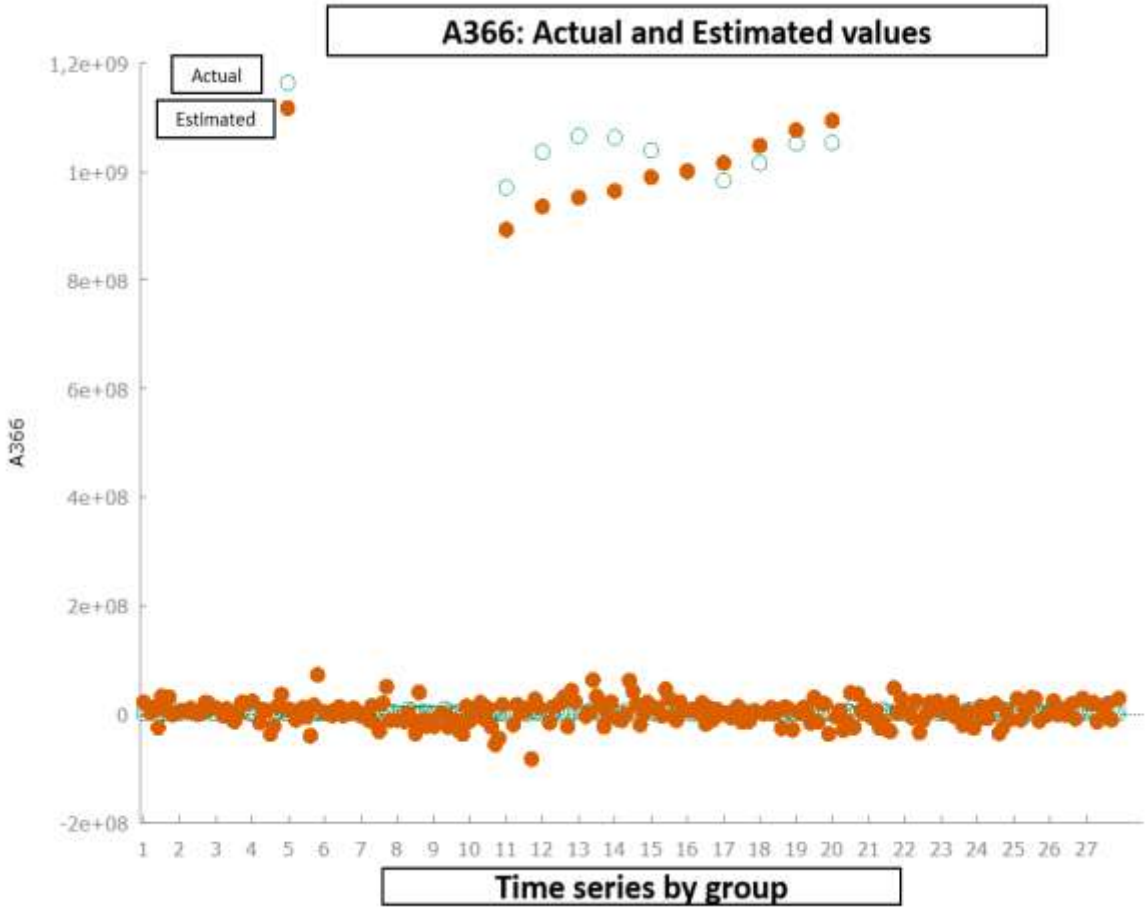
A105	15,1508	2,37309	6,384	<0,0001	***
A109	27,3128	3,15486	8,657	<0,0001	***
A136	−5,52739	1,24366	−4,444	<0,0001	***
A146	−1,62874	0,360575	−4,517	<0,0001	***
A150	7,15854	1,50390	4,760	<0,0001	***
A167	83,1441	4,28178	19,42	<0,0001	***
A199	140,035	8,73695	16,03	<0,0001	***
A205	−168,556	11,2975	−14,92	<0,0001	***
A214	10,9356	2,23589	4,891	<0,0001	***
A238	−14,8883	2,69808	−5,518	<0,0001	***
A265	71,7067	9,37550	7,648	<0,0001	***
A278	0,182946	0,0786261	2,327	0,0210	**
A279	0,266946	0,102975	2,592	0,0102	**
A285	−83,6901	13,2861	−6,299	<0,0001	***
A291	−151,526	8,96576	−16,90	<0,0001	***
A295	27,8480	2,35694	11,82	<0,0001	***
A298	37,1321	5,55824	6,681	<0,0001	***
A301	−21,3490	2,21960	−9,618	<0,0001	***
A302	84,7840	2,51583	33,70	<0,0001	***
A303	−61,5699	4,52257	−13,61	<0,0001	***
A305	137,362	10,5981	12,96	<0,0001	***
A324	1,29045	0,202443	6,374	<0,0001	***
A325	−1,27214	0,222101	−5,728	<0,0001	***
A338	−71,7959	2,12958	−33,71	<0,0001	***
A341	6,69247	0,890611	7,514	<0,0001	***
A343	0,158708	0,0342625	4,632	<0,0001	***
A344	−5,62597	1,38277	−4,069	<0,0001	***
A345	5,46925	1,34706	4,060	<0,0001	***
A346	4,92766	1,37026	3,596	0,0004	***
A350	−0,120289	0,0245716	−4,895	<0,0001	***
A391	−0,541859	0,0946413	−5,725	<0,0001	***

Statistiche basate sui dati ponderati:

Quadratic sum of residuals	219,4751	Standard error of the regression	1,042358
R-squar	0,987992	Correct R-square	0,985793
F (37, 202)	449,2106	P-value (F)	3,1e-174
Log-likelihood	−329,8172	Akaike'scriterion	735,6345
Schwarz'scriterion	867,8988	Hannan-Quinn	788,9273

Statistics based on original data:

Dependent variable mean	46040082	Mean squared deviation of the dependent variable	2,05e+08
Quadratic sum of residuals	1,44e+17	Standard error of the regression	26697723



Descriptive statistics, using observations 1:01 - 27:10 (missing values have been skipped)				
Variable	Average	Median	Minimum	Maximum
A8	1,6540e+007	9,8285e+006	4,1447e+005	8,3093e+007
A33	1,9840e+006	1,7571e+006	5,7956e+005	9,4566e+006
A48	9,9835e+008	1,0000e+009	8,7726e+008	1,1050e+009
A50	2,9298e+006	2,9305e+006	5786,6	7,9380e+006
A62	2,8104e+006	2,6335e+006	0,68901	8,3324e+006
A101	2,5000e+006	2,0852e+006	0,38652	8,5670e+006
A105	3,4544e+006	2,5096e+006	0,34385	9,9375e+006
A109	1,7498e+006	1,3507e+006	0,18183	6,5902e+006
A136	3,8720e+007	2,0999e+006	5577,5	1,0627e+009
A146	3,8424e+007	1,7532e+006	-2,7581e+006	1,0083e+009
A150	3,8052e+007	1,7226e+006	-1,0805e+006	1,0478e+009
A167	3,1282e+006	2,8673e+006	6487,9	8,6298e+006
A199	2,7300e+006	2,2227e+006	26062,	9,1939e+006
A205	2,9502e+006	3,1805e+006	7,6332e+005	6,7661e+006
A214	3,1556e+006	2,1931e+006	27431,	2,3801e+007
A238	2,7965e+006	2,7094e+006	7,6677e+005	7,2263e+006
A265	3,1146e+006	2,3350e+006	33068,	8,5789e+006
A278	5,5571e+007	4,7530e+007	-1,2970e+008	5,5953e+008
A279	-3,2884e+007	-2,3235e+007	-3,0877e+008	2,8208e+007
A285	2,5659e+006	1,9537e+006	22502,	9,0300e+006

A291	2,5309e+006	1,9617e+006	23279,	8,3986e+006
A295	2,5849e+006	1,8516e+006	11944,	9,9104e+006
A298	3,0700e+006	2,8226e+006	0,91417	8,6033e+006
A301	3,1837e+006	2,0365e+006	11328,	9,1381e+006
A302	3,5132e+006	3,0941e+006	10286,	8,9669e+006
A303	3,8134e+006	3,6391e+006	6398,5	8,3676e+006
A305	3,4460e+006	3,7132e+006	1,0310e+006	7,1798e+006
A324	5,7390e+008	5,2720e+008	3,3046e+008	1,1730e+009
A325	6,3881e+008	6,0772e+008	3,5495e+008	1,1730e+009
A338	3,9562e+006	3,8002e+006	13004,	9,2305e+006
A341	2,5554e+007	2,5950e+007	0,85429	4,2188e+007
A343	9,8178e+008	9,9459e+008	6,1183e+008	1,2765e+009
A344	9,9956e+008	1,0000e+009	7,7276e+008	1,1489e+009
A345	9,9690e+008	9,9967e+008	8,6617e+008	1,1147e+009
A346	1,0022e+009	1,0016e+009	8,8358e+008	1,0790e+009
A350	4,0643e+007	2,7644e+006	22292,	1,0473e+009
A391	9,5481e+008	9,9476e+008	-1,1884e+007	1,0735e+009
Variable	Mean Square Deviation	Coeff. Of Variation	Asymmetry	Kurtosis
A8	2,1507e+007	1,3003	1,8587	2,2577
A33	1,3889e+006	0,70007	2,8509	9,4596
A48	3,8215e+007	0,038278	-0,31092	0,76325
A50	2,0130e+006	0,68709	0,52144	-0,78950
A62	1,6407e+006	0,58380	0,53471	-0,23307
A101	1,8941e+006	0,75765	1,2046	1,1100
A105	2,6370e+006	0,76339	0,59259	-0,82228
A109	1,5292e+006	0,87392	0,81841	0,050016
A136	1,8484e+008	4,7738	4,9214	22,292
A146	1,8654e+008	4,8548	4,9040	22,058
A150	1,8459e+008	4,8510	4,9182	22,246
A167	2,0064e+006	0,64138	0,71570	0,0068053
A199	1,7600e+006	0,64468	1,2180	1,6445
A205	1,3393e+006	0,45397	0,25461	-0,65911
A214	3,3670e+006	1,0670	3,6580	16,072
A238	1,3376e+006	0,47832	0,34860	-0,53458
A265	1,9582e+006	0,62872	0,97765	0,42918
A278	6,7448e+007	1,2137	2,7038	15,365
A279	4,5727e+007	1,3906	-3,3310	15,525
A285	1,6730e+006	0,65203	1,1724	1,2225
A291	1,6669e+006	0,65860	1,1438	1,1806
A295	2,1230e+006	0,82132	1,4394	1,5131
A298	1,8843e+006	0,61378	0,65213	-0,32946
A301	2,5338e+006	0,79586	0,82645	-0,64042
A302	2,3977e+006	0,68249	0,41090	-1,1594
A303	2,1891e+006	0,57405	0,15442	-1,0002
A305	1,5776e+006	0,45780	0,11004	-1,0735
A324	1,6438e+008	0,28643	2,1705	3,7468
A325	1,4648e+008	0,22930	1,8309	3,1465
A338	2,7842e+006	0,70375	0,15337	-1,3236
A341	7,3399e+006	0,28723	-0,57578	1,3236
A343	9,5944e+007	0,097724	-0,61785	1,7618
A344	4,8463e+007	0,048484	-1,3053	6,8572
A345	2,9512e+007	0,029604	-0,62258	4,9671

A346	2,5419e+007	0,025363	-1,6335	7,5056
A350	1,9074e+008	4,6931	4,9061	22,089
A391	1,8887e+008	0,19781	-4,8000	21,395
Variable	5% Perc.	95% Perc.	Range interquartile	Missing
A8	5,3219e+005	6,7051e+007	1,4219e+007	10
A33	7,3725e+005	5,0160e+006	9,3182e+005	0
A48	9,2549e+008	1,0611e+009	3,2596e+007	0
A50	5,8342e+005	6,8218e+006	3,4518e+006	0
A62	6,5764e+005	5,9963e+006	2,3938e+006	0
A101	0,79437	6,6882e+006	1,9719e+006	10
A105	0,61444	8,3697e+006	4,3045e+006	10
A109	0,32567	4,9972e+006	2,2312e+006	10
A136	3,4646e+005	8,0206e+006	3,0380e+006	0
A146	-6,9141e+005	7,5235e+006	2,8231e+006	0
A150	-0,10261	7,0140e+006	2,2454e+006	0
A167	53094,	7,2080e+006	2,5185e+006	0
A199	6,1773e+005	6,8172e+006	2,0007e+006	0
A205	1,0197e+006	5,3538e+006	2,2213e+006	0
A214	6,1554e+005	7,2175e+006	2,2038e+006	0
A238	8,9125e+005	4,8727e+006	2,2352e+006	0
A265	8,2466e+005	7,3821e+006	2,2128e+006	0
A278	-2,5732e+007	1,5390e+008	5,4978e+007	10
A279	-1,0090e+008	1,4605e+007	3,2267e+007	10
A285	6,3108e+005	6,1405e+006	1,7768e+006	0
A291	5,4186e+005	6,2713e+006	1,8377e+006	0
A295	6,1078e+005	7,1295e+006	2,1939e+006	0
A298	7,8931e+005	6,5775e+006	2,8910e+006	0
A301	7,4405e+005	8,0727e+006	3,4359e+006	0
A302	7,5180e+005	7,5553e+006	4,5566e+006	0
A303	6,6353e+005	7,4087e+006	3,7651e+006	0
A305	1,2071e+006	5,9513e+006	2,6281e+006	0
A324	4,4372e+008	1,0002e+009	7,7633e+007	0
A325	4,9168e+008	1,0002e+009	9,1869e+007	0
A338	14671,	8,4514e+006	5,0384e+006	0
A341	1,3997e+007	3,5821e+007	9,5557e+006	0
A343	8,1429e+008	1,1357e+009	9,8704e+007	0
A344	9,2969e+008	1,0776e+009	3,9532e+007	0
A345	9,5341e+008	1,0438e+009	2,1749e+007	0
A346	9,6914e+008	1,0380e+009	1,6355e+007	0
A350	7,1066e+005	8,9530e+006	4,0036e+006	0
A391	9,3708e+008	1,0248e+009	2,5430e+007	0

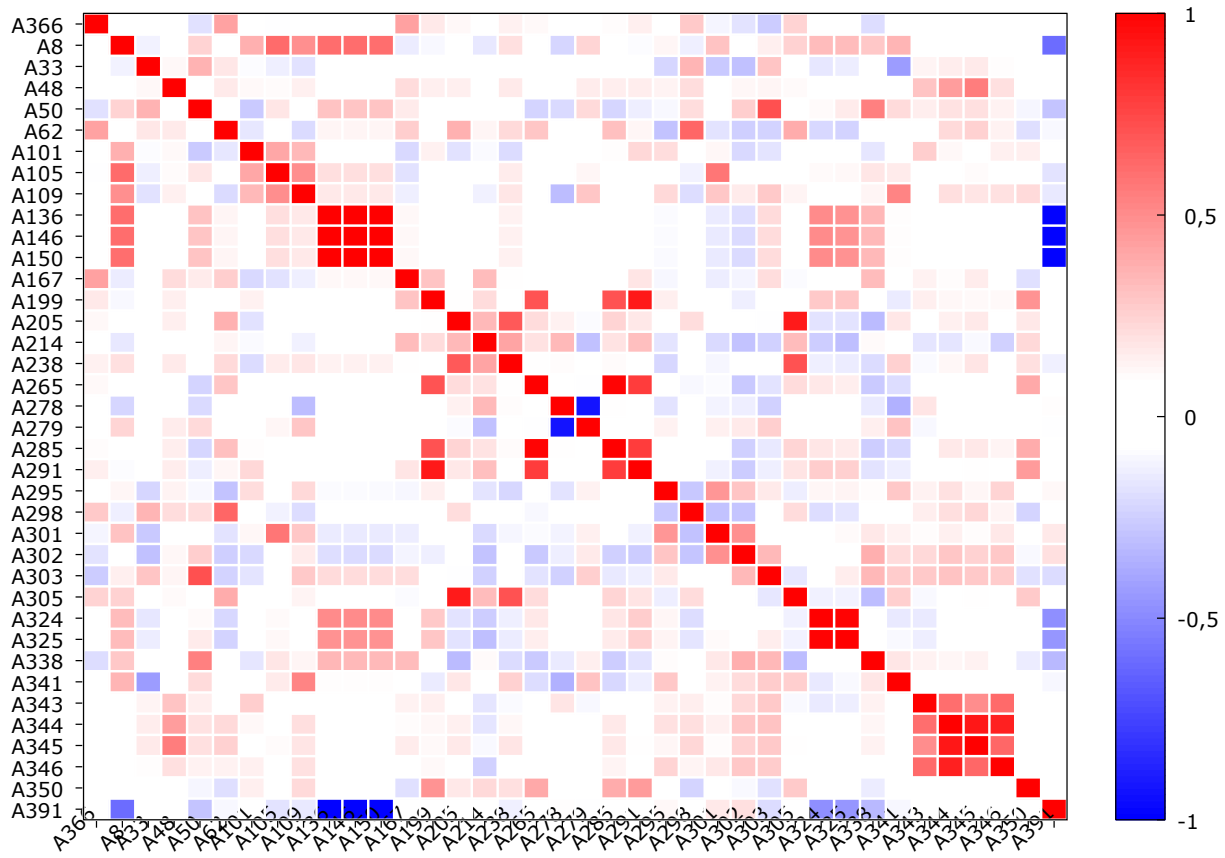


Figure 1. Correlation matrix.