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**Article**

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# INTERNATIONAL TRADE DURING THE CRISIS. DETERMINANTS

Cristian Spiridon\*

**Abstract:** *This article aims to analyze how the financial crisis that bursted in the mid-2008 led to a global and regional drop in trade flows. It starts from a comparison of the Great Depression shock to what happened during the Great Recession. Based on the similarities and differences found in the literature we take a simple econometric analysis to study the relationship between income, private lending and imports of goods by different countries from the financial meltdown starting point. The main findings consist of the magnitude heterogeneity of the decrease in income and credit at the regional level and on country groups according to the degree of development and the uttering of new factors influencing world trade (risk shock, increasing uncertainty, escalating non-tariff protectionist measures).*

**Keywords:** international trade; financial crisis; Great Depression; Great Recession.

**JEL Classification:** F01; F13; F14; F17; F23.

## INTRODUCTION

In the last two decades, unprecedented growth of world gross domestic product was associated with a rapid increase in economic global interdependence. International trade was the glue that strengthened business and political relationships between countries. Since the 1990's exchange transactions between states have gained increasing importance in the economic activities of more and more regions. The trend of these exchanges was disrupted by the financial crisis that bursted in 2008 having a critical impact on the link international trade - growth. As well as during the Great Depression in the years 1929-1933, the question being asked has been what factors caused the trade decline. According to conventional trade theory in modern general equilibrium situation, the two main factors that determine international bilateral trade are terms of production and income of both partners and international trade barriers (tariffs, international transport, insurance costs, volatility exchange rates, the availability of trade credit) (Anderson and van Wincoop, 2004). Responses variates between two alternatives: international trade global collapse can be attributed to one of the two factors listed above or a vicious cycle occurred, with causality running from income to trade, from trade to trade barriers and from trade barriers to trade and trade back to income.

Recent contributions to the literature on the synchronization of business cycles suggest that a doubling of bilateral trade correlation intensity would increase production movements by about 0.06 relative to a normal average correlation of about 0.3 (Frankel and Rose, 1998). Empirical evidence indicates that greater trade integration in the 1930s would have increased exposure to economic shocks from outside. However, during the Great Depression, focusing on the U.S. situation, it can

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be observed that although exports fell by around 60% during 1929 and 1933 cannot be explained by a general reduction of income of 30% by the business cycles synchronization theory (even a commercial multiplier of 3 could not decrease aggregate income by more than 9%). If we take into account that the United States recorded a share of trade as a ratio of gross domestic product by about 5% in 1929, the existence of additional factors as determinants of trade decline to those related to business cycles becomes obvious. Using general equilibrium models of intermediate goods essential to the final production of the United States, Irwin (1998) concluded that when the U.S. raised tariffs on intermediate goods for inputs of the utmost importance, the production factors marginal productivity as well as revenues decreased. On the same topic, Crucini and Kahn (1996) argue that the decline in production due to raising tariffs during the Great Depression was very small compared to the aggregate gross domestic product decrease of 30% (estimating a 2% decrease in output due to rising tariffs). On the other hand, Eichengreen (1989) considers that the charges have been beneficial to have had a reflationary impact (a domestic price level decrease), in such case tariffs caused the avoidance of real wage escalation due to their rigidities and limited real growth in the debt value. Impairments (devaluations) is another measure of protection and restoration by stimulating output and exports. Devaluations have had a number of adverse effects as follows: they changed the party that bears the costs (beggar - thy - neighbor reactions), stimulated the economy through monetary easing policies or output across borders through a contagion of international low interest rates. The effects of devaluations and monetary expansion would have been higher if all countries had taken these measures simultaneously during Great Depression. There are important lessons to be learned from the Great Depression such that empirical findings prevailed the following: large economically closed countries recording declining revenues and rising tariffs encountered a trade decline while in small and opened economies trade barriers had a stronger role than income and declining trade played an important role in the collapse of revenues. Turning to the monetary policy during the Great Recession, monetary policies were less coordinated between countries (the only exception is the European Monetary Union). Major advancements in economic structure and policies have changed the ground compared to the 1930 field. Countercyclical fiscal policies and government spending accounted for by large national governments and the services sectors are generally used. The comovement is still a problem, but would have been higher in the absence of counter-cyclical fiscal policy that came into effect in 2008 and 2009. Two other important factors that have helped to prevent a case like that of the Great Depression are: fluctuating exchange rates - the gold standard contributed to the rigidity of tariff escalation - (allowing adjustments and monetary policy makers to release constraints permitting them to adopt expansionary policies – no longer being the case for tariffs) and the World Trade

Organisation that was able to impose sanctions on protectionism and assiduously promoted multilateralism with good results in a significant number of trading blocks.

Overall, comparing the Great Depression to the Great Recession, has to be pointed out that the output and consumption configuration changed radically. The collapse bursted in 2008 is considered by the most of the research literature to have been caused by the uncertainty and changes in trade costs in interaction with distribution channels. During the Great Depression, on the other hand, income losses, tariffs and other policy issues were most important in explaining the decline in trade. Although policy makers learned to avoid successive rounds of escalating trade tariffs and maintain revenue growth, today's Great Recession has produced the same decline in trade in the first year after the outburst as during the Great Depression. The fact that trade returned on growth trend after the first year is a sign of optimism and some lessons have been learned (though some challenges still remain).

In the next section the focus will be on the econometric analysis of the factors that are considered to have had an impact on international trade during the Great Recession. Determinants such as income, tariff barriers, trade in intermediate goods, trade credit availability and volatility in foreign direct investment (FDI) will be considered in the study undertaken.

## **1. DETERMINANTS OF INTERNATIONAL TRADE DURING THE GREAT DEPRESSION**

The analysis was conducted on a sample of 116 countries, of which three countries from North America, 19 located in the Central America region, 36 in Europe, 10 independent countries CIS, 15 African countries, 12 from Middle East region and 21 from Asia and Oceania. Countries were selected because of statistical data availability on several years and by reason that they represent more than 0.02 % of international trade. The period under review is that of the interval 2001 to 2013 (using estimates for 2012 and 2013 respectively). Also we used aggregated data on an annual basis.

$$Y = \alpha + \beta_1 \times X_{1t} + \beta_2 \times X_{2t} + \beta_3 \times X_{3t} + \beta_4 \times X_{4t} + \beta_5 \times X_{5t} + \beta_6 \times X_{6t} + \beta_7 \times X_{7t} + \varepsilon$$

where

Y - annual growth of imports of a country (%)

and independent variables are:

- $X_{1t}$  – annual growth of GDP per capita change (%);
- $X_{2t}$  – domestic credit to the private sector as a percentage of GDP change (%);
- $X_{3t}$  – change in a country's export growth (%);
- $X_{4t}$  – average tariffs applied to imports increase (%)

- $X_{5t}$  – the share of imports of intermediate goods in GDP change (%);
- $X_{6t}$  – net FDI flows change (%)
- $\varepsilon$  – random error;
- $\alpha, \beta_i$ , with  $i = \overline{1,6}$  regression coefficients.

**Table 1 - Linear regression of imports volatility on several independent variables**

IMPR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
MODPIB	1.635659	.2054916	7.96	0.000	1.230523 2.040796
EXPMOD	.4329822	.0852206	5.08	0.000	.2649658 .6009985
ISDMOD	.0024996	.0014413	1.73	0.084	-.0003421 .0053413
CREDDOMMOD	.0509377	.0451247	1.13	0.260	-.0380278
.1399032					
MODINTFIN	-.0283622	.0988209	-0.29	0.774	-.2231921
.1664678					
TAR	1.540791	1.440452	1.07	0.286	-1.299127
4.380708					
RS	.3291177	.1691553	1.95	0.053	-.0043799
.6626154					
_cons	-7.481301	3.308804	-2.26	0.025	-14.00476 -
.9578396					
<b>sigma_u   2.9827031</b>					
<b>sigma_e   6.5372726</b>					
<b>rho   .17230477 (fraction of variance due to u_i)</b>					

Source: Own calculations

Regressing the dependent variable (annual growth of imports of a country (%)) on the six explanatory variables we observed that only two of them are statistically significant so that partly explain the variation of the latter. We validate the fact that tariffs on imported goods during the economic crisis bursted in 2008 did not have a significant impact on trade. Moreover, there was a downward trend in both the period before the financial meltdown and the interval after 2008. Increasing unemployment in many countries of the world along with the outbreak of the financial collapse can explain the decrease of imports. This can be attributed to the heterogeneity recorded among countries as well as a low elasticity of consumption of imported goods relative to domestic incomes. Consequently, statistically insignificant independent variables are dropped (because of lack of explanatory power) and we run back panel data regression.

**Table 2 - Linear regression of imports volatility on significant independent variables**

IMPR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
MODPIB	1.688645	.1004177	16.82	0.000	1.491581 1.885708
EXPMOD	.2271334	.0392443	5.79	0.000	.1501188 .3041479
CREDDOMMOD	.0671876	.0216389	3.10	0.002	.0247226 .1096526
_cons	-1.978794	.4685007	-4.22	0.000	-2.898197 -1.05939
sigma_u   5.5253022					

sigma\_e | 9.7094747

rho | .2446175 (fraction of variance due to u\_i)

Source: Own calculations

Given that the value of P is  $< 0.05$  for all three independent variables (GDP growth change, export volume growth change, domestic credit to private sector as a percentage of GDP change), we can state, at a significance level of 5%, that  $\beta_i < 0$ . This suggests that independent variables have significant explanatory power on country imports variation in the selected sample.  $R^2 = 0.40$  indicates a good regression model adequacy (40% of the variation of good imports can be explained by the cumulative variation of three variables: changes in gross domestic product per capita, exports change and domestic credit to the private sector as percentage of GDP change. The remaining 60% may be attributed to other factors (exchange rate volatility, non-tariff protectionist measures, transportation costs, uncertainty hanging over the actors involved in international trade and so on).

One notable issue is the influence of GDP change from previous years on imports of the current year. Thus, an increase by one percentage of the change in GDP per capita in year t-1 leads to imports decrease of 0.23% in year t. Period t-2 also plays an impact on imports and domestic output growth (a decrease of 0.34 %). The paradox is that the immediate influence of GDP growth on imports is positive while the impact of previous periods is negative.

Regional or local heterogeneity among different categories of countries (developed, developing, least developed) regarding imports change due to influence of key factors calls for a more detailed analysis of the crisis indicators affecting international trade.

**Table 3 - Imports and its determinants by countries and geografic location**

	Variable	Coef.	R <sup>2</sup>	P-values	Lower Interval	Upper Interval
<b>Developed countries</b>	MODPIB	1,52	60,01%	0	1,26	1,77
	EXP MOD	0,40		0	0,29	0,51
	RS	0,25		0,21	0,03	0,47
<b>Developing countries</b>	MODPIB	1,91	33%	0	1,63	2,19
	EXP MOD	0,16		0,002	0,05	0,26
	CREDDOMMOD	0,06		0,045	0,001	0,132
<b>Least developed countries</b>	MODPIB	insignificant	-	-	-	-
	EXP MOD	insignificant		-	-	-
	CREDDOMMOD	insignificant		-	-	-
European Union	MODPIB	1,39	76,34%	0	1,15	1,62
	EXP MOD	0,56		0	0,45	0,66
	CREDDOMMOD	insignificant		-	-	-
NAFTA	MODPIB	2,10	91,12%	0	1,07	3,13
	EXP MOD	0,58		0,001	0,25	0,9
	CREDDOMMOD	insignificant		-	-	-
MERCOSUR	MODPIB	3,65	66,93	0	2,86	4,44
	EXP MOD	-		-	-	-
	CREDDOMMOD	-		-	-	-
ASEAN	MODPIB	1,03	27%	0,029	0,107	1,96

	Variable	Coef.	R <sup>2</sup>	P-values	Lower Interval	Upper Interval
GCC	EXP MOD	0,64	-	0	0,34	0,94
	CREDDOMMOD	insignificant		-	-	-
	MODPIB	insignificant		-	-	-
	EXP MOD	insignificant		-	-	-
	CREDDOMMOD	insignificant		-	-	-
North America	MODPIB	2,10	91,12%	0	1,07	3,13
	EXP MOD	0,58		0,001	0,25	0,9
	CREDDOMMOD	insignificant		-	-	-
South and Central America	MODPIB	3,24	50,83%	0	2,76	3,72
	EXP MOD	-		-	-	-
	CREDDOMMOD	insignificant		-	-	-
Europe	MODPIB	1,67	60,4%	0	1,39	1,95
	EXP MOD	0,41		0	0,29	0,53
	CREDDOMMOD	Insignificant		-	-	-
CIS States	MODPIB	0,98	28,91%	0,003	0,35	1,60
	EXP MOD	Insignificant		-	-	-
	CREDDOMMOD	Insignificant		-	-	-
Africa	MODPIB	2,14	23,40%	0	1,44	2,84
	EXP MOD	Insignificant		-	-	-
	CREDDOMMOD	0,21		0,009	0,05	0,37
Middle East	MODPIB	0,76	23,61%	0,021	0,11	1,41
	EXP MOD	insignificant		-	-	-
	CREDDOMMOD	0,13		0,042	0,004	0,257
Asia and Oceania	MODPIB	1,18	44,55%	0	0,69	1,66
	EXP MOD	0,60		0	0,46	0,74
	CREDDOMMOD	insignificant		-	-	-

Source: Own calculations using data from World Development Indicators (World Bank Database), World Development Indicators (World Bank Database), Laborsta – Database of labour statistics, Ilostat – New Database of labour statistics, World Economic Outlook Database (IMF Database), Unctad Handbook of statistics 2012, Global Trade Alert (<http://www.globaltradealert.org/>)

When the analysis is done on clusters of countries according to the degree of development, it can be seen that the industrialized countries of the world tend to have suffered from the decline in the GDP per capita and domestic credit to the private sector at a higher rate compared to developing countries. Factors other than those listed above have influenced the decline in imports in the latter category of countries. A determinant that is not included in the model may be a so-called *risk shock*, according to which investors would have become cautious about investment projects. Thus, investments in developing countries (especially in emerging economies) would have fallen under this reasoning, as well as investment in export sectors of trading partner countries. The impact of such a shock on a country depends on its international financial connections (those with large net external debt where the external portfolio was exposed to liquidity risk), macroeconomic conditions (those that have experienced a credit financed boom where domestic growth and fiscal prospects worsened) and their dependence on world trade (countries dependent on exports, especially exports of goods and cyclical investment and durable goods). The decrease in imports from developed and developing countries could be caused by restrained cross-border lending in international banking



sector. Finally, the proliferation of non-tariff protection measures can join the other factors impacting on trade decline. Effects were propagated among many countries throughout international trade and financial links. Response was provided in the form of direct funding grants, especially loans and guarantees to save a number of financial institutions in industrialized countries of the world (Baldwin and Evenett, 2010). These emergency measures were associated with public policy objectives considered necessary to stop the spread of systemic disaster and assist the restoration of normal functioning of financial markets, a critical element for both consumers and producers worldwide. Several countries have also introduced subsidies to encourage consumers to purchase specific products such as funding a certain part of the purchasing price. Such subsidy schemes available to consumers implemented in a number of advanced economies like Germany, France and Britain were used as measures to stimulate domestic demand (considered ways to achieve public policy objectives) . Moreover, these measures have been considered non-discriminatory by international institutions (World Trade Organization Report (WTO), 2012).

In times of economic distress, however, high rates of unemployment can push the government to resort to non-tariff measures discriminating between similar inputs produced domestically or imported. In such case becomes difficult to distinguish between measures taken to achieve public policy objectives (although they may have adverse effects on trade) and what is named *hidden protectionism*. This ambiguity regarding the action of economic and policy decision makers is further complicated by the growing importance of trade in intermediate goods in the global supply chains (Koopman et al., 2010). While trade in intermediate goods do not explain aggregate decline in imports, these exchanges were strongly affected by the financial crisis along with aggregate imports. Once the outbreak of the global financial crisis in the early 2008, the escalation of protectionist measures started. In November 2008 - December 2009 period governments around the world have implemented 365 protectionist policy measures hope to improve domestic economy not taking into account the costs that foreign trading partners will bear on consequence. Despite constant exhortations that G20 countries (G20 represents 90% of global GDP, 80 % of global international trade and two-thirds of the world population) have issued towards trade liberalization, in the aforementioned period they have applied 220 protectionist measures and implemented only 11 liberalization policies concerning international trade in goods and services. Thus, two thirds of restrictive trade measures have been taken by industrialized countries of the world in the period immediately following the onset of the financial shock (Evenett, 2010).

From November 2008 to December 2009 China has been the most affected country in terms of protectionist trade measures, being directly involved in 160 of hazardous actions. Only European Union approached China with 152 restrictive measures against member states. These two entities



were followed in order by the United States, Germany, France, Belgium, Japan, UK, Netherlands and Italy (each with over 100 measures against). On the other hand, the European Union countries (EU27) imposed the most numerous restrictions on external trade (123), followed by Russian Federation (42), Argentina (25), Germany (24), United Kingdom (19), Italy (15), China, Hungary, Spain (13), and Brazil (12). Through the actions adopted by EU member states there have been obstructed the trade interests of 149 exchange partners. Countries such as India, China, Russian Federation, Argentina, Indonesia, UK, the US, France and Germany recorded the same quantitative impact of over 100 trading partners affected. We can observe that the main actors of the restrictive trade measures taken after the global economic crisis burst consist mostly of industrialized countries and large emerging economies that have seen considerable growth in the last decade.

Regarding measures taken which have had a discriminatory impact on foreign commercial interests during the period under observation, 36% of these shares were represented by cautionary or government support measures for domestic sectors to overcome the crisis. These were followed by defensive trade policies (anti-dumping, safeguard measures, measures against exports subsidies) - about 17%, tariff measures (13%), measures related to public procurements (6%), export subsidies (4%), other non-tariff measures (3%), hazardous actions against migration (3%), sanitary and phytosanitary measures (3%), taxes and export restrictions (3%), imports prohibitions (3%) and other measures (9%). The most affected sectors were: financial intermediation services and services ancillary thereto, specialized machinery industry, basic metals industry, transport equipment, meat industry, fruit, vegetables, oils and fats, metal products except machinery and equipment, agricultural products, horticulture and gardening, basic chemicals, dairy products, live animals and animal products, furniture, textile, rubber and plastic products.

## CONCLUSIONS

Resuming, it may refer that, compared to the measures taken during the Great Depression to protect domestic industries, security tools have improved during the Great Recession, they had become much less obvious and had strong political support despite their discriminatory impact. The factors behind the economic collapse during the Great Depression differ from those that caused the 2008 financial crisis also. Though the decrease is based on income and restrained lending to private sector (due to reduced banking activity severely hit by the recession), international trade was influenced by several other factors more difficult to grasp in an econometric analysis. Moreover, although the decline in GDP in the first year of the crisis was quasi general, global negative

heterogeneity among states (either classified by the degree of development or by geographical region) was highly visible. North America and Europe trade and trade of developed countries of the world in particular have been more affected by the decline in income and credit compared to countries in other regions.

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