



Disaster and International Trade: Chile's and Ecuador's earthquakes

Author, affiliations: Hugo Cahueñas, Universidad San Francisco de Quito/World Trade Institute-University of Bern

Email: hcahuenas@usfq.edu.ec

Abstract:

This paper focuses on the international trade disruption due to hazardous events interacting with the institutional capacity, focus on export and import volume, and the relationship with Disaster Risk Management policies (if they are) on international trade. This research analyzes two cases studies: Chile after the earthquake of 2010 and Ecuador after the 2016 earthquake. First, this article describes the impacts that disasters have on international trade. Second, the article identified the general policies that regulate international trade on disasters, including trade liberalization and risk, trade and development, and trade and disaster response. Third, the impact on international trade in Ecuador and Chile after an earthquake is analyzed. Finally, this paper concludes that it appears difficult to find a direct relationship between disasters and international trade data because several exogenous factors affect the economy of one country; however, commercial agreements spread the risk; therefore, trade agreements, as well-functioning institutions are conducive to an economy, which could be resilient towards disasters.



Introduction:

In 2017, the annual loss from catastrophic disasters was about \$ 264 billion; this raised \$142 billion from the overall losses in 2016; moreover, in 2007 the losses were only \$64 billion (MunichRE, 2019), which mean that losses in 2017 were 200 billion more than ten years before. The United Nations Office for Disaster Risk Reduction (UNISDR) defines 'disaster' as a severe disruption of the functioning of a society due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading losses and impacts on: human beings, materials, the economy and the environment (UNISDR, 2017). Hence, disasters impact various economic variables, for instance: consumption, investment, and trade (Phutaworavong, 2014); however, the capacity from society can be a condition that can reduce the impacts and losses. Auffret (2003) identified the main impacts of catastrophic events in 16 countries¹ So the results were: a) decline in the growth of production, b) decline in the growth of investment, c) decline in consumption growth, mainly in private consumption, and d) deterioration of the account of the balance of payments (Auffret, 2003, p. 1). Disasters affect trade in both exporting and importing countries, and the capacity of governance is among the key factors to determine the magnitude of trade effects (Gassebner, Keck, & Teh, 2006). Currently, there are several studies about international trade and disasters (Osberghaus, 2019); however, there are not cases of study or comparative studies between countries. Moreover, the relationship between trade liberalization and risk and vulnerability is very poorly researched (David, Nordström, & Winters, 1999, p. 58).

Under that umbrella, this paper focuses on the international trade disruption due to hazardous events interacting with the institutional capacity, focus on export and import volume, and the relationship with Disaster Risk Management policies (if they are) on international trade. This research analyzes two cases studies: Chile after the earthquake of 2010 and Ecuador after the 2016 earthquake. First, this article describes the global impacts that disasters have on international trade. Second, the article identified the general policies that regulate international

¹. Auffret analyzed six countries from the Caribbean region and ten countries from Latin America, between 1970 and 1999.



trade on disasters, including trade liberalization and risk, trade and development, and trade and disaster response. Third, the impact on international trade in Ecuador and Chile after an earthquake is analyzed. Finally, this paper concludes that it appears difficult to find a direct relationship between disasters and international trade data because several exogenous factors affect the economy of one country; however, commercial agreements spread the risk; therefore, trade agreements, as well-functioning institutions are conducive to an economy, which could be resilient towards disasters.

International trade and disasters

Disasters generate losses and impacts in national economies. Regularly, disasters are related to an immediate contraction in economic production, deterioration of external and fiscal balances, and an increase of poverty (Rasmussen, 2004, p. 16). The impact of a massive disaster on international trade can be transmitted directly or indirectly. Direct impacts on exports and imports can occur due to the human losses and injuries, and the destruction or damage of infrastructure and equipment related to the export or import sectors (Gassebner et al., 2006, p. 5). These impacts also include the damage to public infrastructures, such as roads, bridges, railways, and telecommunication systems, because these kinds of harms directly disrupt the exportation and importation processes (Gassebner et al., 2006, p. 5). On the other hand, indirect impacts on exports and imports occur when there is a reduction in aggregate economic activity (GDP) (Gassebner et al., 2006, p. 6). Disasters impact on production capability; and disasters may also modify consumption behavior (Gassebner et al., 2006, p. 13). Therefore, disaster could deteriorate the external balance.

Disasters impact exportations and importations. Major disasters significantly negative affect trade in the exporting sector (Gassebner et al., 2006, p. 13). Exports seem to be affected negatively by direct impacts because exports decline due to production losses on the infrastructure and the destruction of transport service (Osberghaus, 2019, pp. 9, 11). On the other side, the consequences are unpredictable for the importing sector because imports may decrease, increase, or be unaffected by natural disasters (Osberghaus, 2019, p. 11). For instance, a decline in import demand may be a consequence of lower incomes (Gassebner et



al., 2006, p. 13). In fact, according to Rasmussen (2004), in the countries with a dependence on imports on GDP, a colossal disaster can reduce imports if it causes the level of aggregate economic activity to contract, even temporarily. Therefore, imports are mainly affected by indirect impacts and exports by direct ones.

Another scenario may also arise after a disaster; the demand for imports could change due to the reception of external aid (Osberghaus, 2019, p. 1). A major reconstruction or rebuilding of damaged infrastructure could increase imports because the required materials, technology, or skills could come from other countries (Gassebner et al., 2006, p. 6). If external actors provide financial assistance to the affected country, the effect assures to be larger because there would be a consequent inflow of goods and services implementing the transfer of financial assistance from international cooperation (Gassebner et al., 2006, p. 6). Considering the impact that disasters could have on trade, it seems necessary to analyze the relation of international trade and governance.

International trade and governance

Disasters impact trade in both exporting and importing nations and Governance plays a fundamental role in the effects caused by disasters (Gassebner et al., 2006, pp. 14, 17). For instance, nations with higher-quality institutions suffer less death and damages from disasters than nations with lower-quality institutions, which also suffer more impacts due to corruption (Kahn, 2005).² Nevertheless, disasters reduce both exports and imports in countries with the most institutional standards (Gassebner et al., 2006, p. 15). Moreover, developing countries suffer most from disasters than developed countries, “in terms of the number of persons affected and the value of the damage” (Rasmussen, 2004, p. 3). Additionally, the political characteristics of a country remain a critical factor in the economic consequences of a disaster (Gassebner et al., 2006, p. 7). Consequently, the public institutions and policies of a country have a relation with the effects of a disaster on international trade flows.

² Government corruption could raise death counts for several reasons, such as the lack of enforcement of building codes, infrastructure quality, and zoning (Kahn, 2005).



The consequences of a disaster differ from country to country. Research in 49 countries shows that disasters have a positive effect on exports but an adverse effect on imports (Phutaworavong, 2014, p. 97). Commonly, middle-income countries will import more commodities to substitute domestic production along with new machinery and equipment for restoration and rebuilding (Phutaworavong, 2014, p. 97). Mainly, disasters could provide the opportunity to update the capital stock and adopt new technologies for the industry sector (Phutaworavong, 2014, p. 98) On the same line, Skidmore and Toya (2002) conclude that nations affected by climatic disasters endure higher rates of human capital accumulation, total factor productivity, and economic increase. Then, disasters can increase human capital accumulations (Gassebner et al., 2006, p. 15).³ In general terms, gross domestic product (GDP) could increase in the period immediately following a natural disaster (Phutaworavong, 2014, p. 94). Consequently, disasters may also be an opportunity for the exporting and importing sector.

It must be said that in the case of middle-income countries, there is no direct relationship between total disasters and exports because these countries can still export goods and services (Phutaworavong, 2014, p. 97). The effect of the frequency of disasters on export volume is ambiguous, depending on the types of disasters and the income level of the country. For instance, in terms of frequency, geophysical disasters, have a significantly adverse effect on exports in high-income countries (Phutaworavong, 2014, p. 98). Similarly to export volume, the effect of the frequency of disasters on import volume is ambiguous, depending on the types of disasters and the income level of the country as well (Phutaworavong, 2014, p. 98). Therefore, the impact of a disaster on international trade depends on several local factors, including governance.

After a disaster, the political risk, the quality of institutions, and the political freedom affect trade flows. Countries with lower political risk have a smaller reduction in international trade flows due to disasters (Phutaworavong, 2014, p. 94). Similarly, disasters more negatively affect

³ Besides, Phutaworavong (2014, p. 94) discovered that climatic disasters are positively correlated with human capital accumulation, total factor productivity growth, and GDP per capita growth.



external trade in countries with low-quality institutions or low levels of political freedom (Phutaworavong, 2014, p. 94). Consequently, countries with low degrees of institutional quality and political freedom face more unfavorable effects on their trade flow (Oh & Reuveny, 2010; Osberghaus, 2019, p. 11). Therefore, well-functioning institutions may be favorable to an economy, which would be relatively resilient towards disasters (Osberghaus, 2019, p. 11).

Trade liberalization and risk

Liberal values consider that free trade has a good impact on wealth creation, international peace, and human dignity (Armstrong, Farrell, & Lambert, 2012, p. 244). Nowadays, the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO) recover the free trade doctrine. Liberal proponents of the WTO consider that trade liberalization contributes to world peace and human dignity (Armstrong et al., 2012, p. 245). For instance, a WTO report argues that trade liberalization contributes to poverty alleviation because free trade stimulates economic growth and discourages arbitrary government intervention in local markets (David et al., 1999). Nevertheless, this report also recognizes that foreign and domestic economies are subject to independent random shocks because trade liberalization increases the weight of foreign relation to domestic shocks in the determination of national welfare (David et al., 1999, p. 57). Moreover, the notion of risk spreading indicates “further trade liberalization would tend to reduce overall risk because it is very unlikely that both international and domestic conditions would both be very good or both be very bad together” (David et al., 1999, p. 57).

The relation of trade liberalization and risks has somewhat ambiguous implications for macroeconomic stability. On one side, openness may encourage better policy positions in general because countries can actively participate in internal and external markets; on the other side, the argument is that more open economies have higher volatility in total income because open economies suffer more heavily from terms of trade shocks (David et al., 1999, p. 58). Consequently, open markets spread the risk, and when they are victims of a national disaster, they have a better policy position because they can actively participate in external markets. Nevertheless, an open economy is also more vulnerable and volatility to external shocks.



Trade and development

Regularly, trade costs are substantially higher in Less Developed Countries (LDCs), including the cost related to transport and logistics, border procedures and regulatory frameworks; weak policies and low capacity in meeting standards are some of the reasons for this higher cost (OECD/WTO, 2015, p. 158). For instance, World Bank data indicates that delays on international trade sum to over 200 working hours in 12 cases of the 189 economies, and 100 hours in 35 (Roberts & Mohammed, 2017, p. 9). Moreover, this indicator does not measure the personal time that exporters need to assemble the documentation required by customs officials, for instance, the personal time required for sanitary certificates for food products (Roberts & Mohammed, 2017, p. 9).

These conditions do not allow LDCs to improve their productivity and competitiveness; consequently, LDCs are unable to realize their trade potential as a means to accelerate economic growth and development (OECD/WTO, 2015, p. 158). A combination of other structural factors undermine the trade balance in LDCs and that allow a disproportionate weight of trade costs, such as: inadequate levels of human development, high levels of export concentration and prominence of Small and Medium-sized Enterprises (SMEs) involved in trade, fragility and conflict, being landlocked or being highly vulnerable to the impact of climate change and/or disasters (OECD/WTO, 2015, p. 158).

Trade and disasters response

The relation between international trade regulations and disaster response has been the concern of several international actors, such as the World Trade Organization (Roberts & Mohammed, 2017) and the International Federation of the Red Cross (Fisher, 2007; IFRC, 2015).⁴

⁴ Mainly, three trade-related issues affect humanitarian response to natural disasters: a) customs requirements affect the flow of relief deliveries due to tariff and non-tariff barrier; b) sanitary, migratory and professional qualifications measures affect the entry of specialized health services and personnel; and c) recognition of legal capacity affects the establishment and operations of relief agencies (Fisher, 2007; Roberts & Mohammed, 2017, p. 5).



Similarly, these researchers argue that it seems to be necessary to reduce border control and cost in order to respond adequately to big disasters (Roberts & Mohammed, 2017, p. 8).

Nevertheless, a complete openness on the market does not mean success in the recovery phase after a disaster. Local suppliers may be pushed away by a sudden surge of imports right after a disaster (Roberts & Mohammed, 2017, p. 15). For instance, during the Ebola crisis in Liberia, the government expressed concern that foreign suppliers were preferred over local products and services; consequently, imports of relief items undermined recovery because local suppliers could not compete with relief goods that were supplied below the cost of production in the exporting country (OECD/WTO, 2015; Roberts & Mohammed, 2017, p. 15).

Economic theory would suggest that, after a disaster, the longer import tariff derogations are in place, the more distortionary the impacts could be on local suppliers and other commercial foreign suppliers (Roberts & Mohammed, 2017, p. 15). Therefore, further research is required on how derogations or exemptions should operate in a disaster.⁵ Nowadays, humanitarian agencies do prefer to provide emergency financing instead of emergency relief goods (Roberts & Mohammed, 2017, p. 15). Moreover, even the derogations or exemptions, the administrative process can be extensive, independently of enjoying privileges (Roberts & Mohammed, 2017, p. 15). In order to analyze how international trade and disaster risk management policies operate in practice, this study will compare two scenarios of disaster and how international trade operated during the response and the recovery phases.

A comparative analysis between Chile and Ecuador

Between 2007 and 2017, 46 relevant geophysical events occurred in South America; as table 1 shows, the 2010 earthquake & tsunami in Chile and the 2016 earthquake in Ecuador were the costliest (MunichRE, 2019). It is difficult to find a direct relationship between disasters and

⁵ Further research should analyze how long exemptions should ideally remain in place? Should derogations be provided on a product or organizational basis? How quickly can responders transition from delivery of pre-positioned relief stocks to locally supplied goods and services? How to avoid discrimination between local and imported sources and ensuring that derogations are operated on a most-favored-nation basis? (Roberts & Mohammed, 2017, p. 15).



international trade data because many facts affect the economic situation of a country. Nevertheless, the comparative analysis between Ecuador (an upper-middle-income country) and Chile (high-income country) permits to identify some links, which should be part of the disaster risk reduction policy, in general, and, expressly, on the recovery phase after a disaster.

Table 1: Costliest relevant geophysical events in South America 2007 – 2017

Date	Event	Affected Area	Overall losses (US\$m, original values)	Insured losses (US\$m, original values)	Fatalities
27-feb-10	Earthquake, tsunami	Chile: Bió Bió, Concepción, Talcahuano, Coronel, Dichato, Chillán, Del Maule, Talca, Curicó, Constitucion, Caleta Duao, Iloca, Pelluhue, Parral, Metropolitana, Santiago, Valparaíso, Putaendo, La Araucanía, Angol, Temuco, Del General Libertador Bernado Ohiggins, Rancagua, Angol, Juan Fernandez Islands	30000	8000	520
16-abr-16	Earthquake	Ecuador: Manabí, Pedernales, Manta, Portoviejo, Esmeraldas, Guayas, Guayaquil, Pichincha, Quito	2000	560	673

Source: (MunichRE, 2019)

In Chile, a high income country (*World Bank Open Data*) with full democracy according to The Economist (2017), on February 27th 2010, an 8.8 earthquake affected the cost of the country with an overall losses of USD \$30 billion, including \$8 billion of insured losses (MunichRE, 2019). On the other side, on April 16th, 2016, a 7.8 earthquake impacted the coast of Ecuador with an overall loss of \$2 billion, including USD 500 million of insured losses (MunichRE, 2019). In 2016, The Economist (2017) qualified Ecuador as a hybrid regime (between authoritarian regimens and flawed democracies), and the World Bank identified Ecuador, according to its income level, as a: Upper middle-income country (*World Bank Open Data*). Chile and Ecuador's events registered direct and indirect impacts on exports and imports. On international trade, as direct impacts, exports decline due to production losses on



the infrastructure and the destruction of transport service (Osberghaus, 2019, p. 9). The following analysis focuses on these two events and compares how a geophysical disaster impacted international trade of both economies, considering the trade and disaster risk management policies (if they exist).

International trade and Chile's earthquake.

In the case of Chile, during 2010, the copper exportation got a maximum level with an average price of US\$39.290 million, which means 43% more than the exportations in 2009 and 2% more in the amount exported (DIRECON, 2011, p. 4). However, the amount of non-copper exportation, “decreased in 19.2%, mainly due to the reduction of the production post-earthquake” (DIRECON, 2011, p. 4). For instance, during the first two months of 2010, the exports of processed foods improved in comparison with the performance shown in 2009; nevertheless, these exports weakened in March as a result of the drop generated in the production as a consequence of the earthquake (DIRECON, 2011, p. 21). For July, the amounts of exports evidenced a recovery; however, this improvement did not compensate the fall generated, which means 2% less than what was registered in 2009 (DIRECON, 2011, p. 21).

Other outstanding examples are salmon and trout markets. Exports of salmon and trout accumulated in 2010 a total amount of USD 2,004 million, slightly lower than the level reached in previous year; also, the industry sold 19% fewer tons than 2009 mainly due to the international economic crisis that affected exports in general, the Infectious Salmon Anaemia (ISA) virus and the earthquake (DIRECON, 2011, p. 23). Finally, exports of pulp and paper, even they accumulated a 17.5% annual recovery in 2010; the growth in the amounts exported is mainly explained by the 45.5% increase in average prices paid by external buyers; meanwhile, the volumes shipped during the year fell by 19.2%, mainly due to the reduction in post-earthquake production (DIRECON, 2011, p. 28). Therefore, Chile's data confirms that, in terms of frequency, geophysical disasters have a significantly adverse effect on exports in high-income countries (Phutaworavong, 2014, p. 98)



Chile is a country with an open economy. Interestingly, during 2010, 92% of Chilean exportation went to countries or blocks with Commercial Agreements: China (24%), the European Union (18%), Japan (10.5%), and United States (10%) (DIRECON, 2011, p. 4).⁶ Similarly to exports, 94% of the total amount imported by Chile in 2010 came from countries or blocks with Trade Agreements; MERCOSUR, the United States, China, and the European Union, represented the 67% of the total imported in that period (DIRECON, 2011, p. 5). Now, it seems appropriate to compare the consequences in Chile's international trade with another kind of economy.

International trade and Ecuador's earthquake

In Ecuador, during 2016, the total exports reached USD 16,797.7 million, it means 8.4% lower (USD 1,532.9 million) compared with 2015 (USD 18,330.6 million) (BCE, 2017, p. 8). Specifically, oil exports, in volume, decreased by 0.3% compared to the result registered in 2015, going from 22,156 thousand metric tons to 22,079 thousand metric tons; moreover, in FOB value, external oil sales decreased by 18% (USD - 1,201.2 million), from USD 6,660.3 million to USD 5,459.2 million (BCE, 2017, p. 8).⁷

Additionally, non-oil exports in 2016 were USD 11,338.5 million, an amount lower by 2.8% (USD 331.8 million) concerning 2015 (BCE, 2017, p. 9). Surprisingly, this group of products registered an increase in volume (metric tons) of 3.6% between the two periods (BCE, 2017, p. 9). It is necessary to detail the differences between traditional non-oil exports and the non-traditional ones. The firsts exports totaled USD 6,457.3 million, which means 2.4% higher than that recorded in 2015 (USD 152.8 million); while the non-traditional ones reached USD 4,881.2 million, (USD -484.6 million), which represents 9% less than the sales made in 2015 (BCE, 2017, p. 9). Specifically, shrimp's export was affected by the earthquake on USD 35 million (INEC, 2017, p. 202) Consequently, even not-oil exports increased in volume,

⁶ China is also the leading destination for Chilean mining exports (USD 14,501 million, 34% of the total sold), followed by the European Union (18%) and Japan (12%). (DIRECON, 2011, p. 5)

⁷ The average unit value of the exported barrel of oil and its derivatives decreased by -18%, from USD 41.9 to USD 34.4 (BCE, 2017, p. 8).



traditional non-oil exports increased by 2.4%; and non-traditional ones decreased by 9%. Therefore, non-traditional exports could be more vulnerable to the effect of the disaster; nevertheless, there is no specific information to confirm that hypothesis. The only precise data is that the earthquake severely affected shrimp's exports, which was one of the leading products of exportation in the area affected by the disaster (INEC, 2017, p. 32). Ecuador's data show that in middle-income countries, there is no direct relationship between total disasters and exports because these countries can still export goods and services (Phutaworavong, 2014, p. 97).

Finally, the leading destination markets for Ecuadorian non-oil exports were: the European Union (USD 2,832 million), the United States (USD 2,583 million), Vietnam (USD 1,116 million), and Russian Federation (USD 769 million) (Cassinelli, 2017, p. 12). During 2016, Ecuador did not have any commercial agreement with these countries.⁸ On the other hand, the main markets of origin of Ecuadorian non-oil imports in 2016 were: China (USD 2,906 million), the United States (USD 1,781 million), the European Union (USD 1,644 million), and Colombia (USD 1,240 million) (Cassinelli, 2017, p. 15). Except for Colombia, who is a member of the Andean Community, in 2016, Ecuador used not to have any trade agreement with those countries. In fact, for 2016, Ecuador used to have a restrictive international trade system. The Ecuadorian Constitution does not promote trade liberalization; it promotes fair trade as an antithesis of free trade (Serrano, 2015, p. 311). The Constitution is not in favor of free trade because it restricts commercial agreements.

Effectively, the events in Chile and Ecuador impacted on exports. Even the impact on the exportation of Chile was higher than in Ecuador, the exportations from Chile quickly recovered from the earthquake and tsunami. Probably, the Commercial Agreements were some of the reasons why Chile's export could resiliently recover from the disaster.

⁸ The commercial agreement signed between Ecuador and the European Union (EU) came into force on January 1, 2017.



Commercial Balance

Both countries, Chile and Ecuador, show a surplus in their trade balance after a disaster. However, the reasons were completely different. In 2010, the Chilean economy recovered from the 2009 crisis, mainly because Chilean products had more demand for their products, mainly where Chile has a commercial agreement. The exportation increased by 30% (US\$ 69. 622 million), while the importations were US\$ 54.499, with an annual expansion of 37% (DIRECON, 2011, p. 4). Therefore, the economic surplus of Chile increased to US\$ 15.123 million in 2010; it means 8% more than the previous year (DIRECON, 2011, p. 4). Chile, with its Commercial Agreement, evidence well-functioning institutions that are conducive to its economy, which is relatively resilient towards disasters (Osberghaus, 2019, p. 11) because the demand of Chilean products increased on their main markets, with whom Chile has commercial agreements.

On the other side, Ecuador's Commercial Balance in 2016 registered a surplus of USD 1,247.0 million, mainly due to the decrease in imports (BCE, 2017). The 2016 Petroleum Trade Balance showed a favorable balance of USD 2,969.1 million; surplus more significant than the one obtained in the same period of 2015 (USD 2,757.0 million), but this was a consequence of the decrease in oil imports and the drop in the average unit value of the barrel exported from crude oil (BCE, 2017, p. 4). Additionally, the non-oil trade balance decreased its deficit (64.8%) compared to the result accounted for in the same 2015 period, going from USD - 4,886.6 million to USD -1,722.0 million (BCE, 2017, p. 4). Moreover, Ecuador registered 175, 3 USD million on additional importation for recovery after the earthquake (INEC, 2017, p. 202).

Therefore, Ecuador's surplus responds to the decrease in imports, while in Chile due to the increase in exports. Chilean economy, with a liberal trade system, seems to be more resilient to disasters, probably, because its economy has diversified the markets through commercial agreements. In those markets, the demand for Chilean products increased. Ecuador also registered a surplus, but this surplus responded to the decrease in oil and non-oil imports, and a balance-of-payments safeguard.



Ecuadorian balance-of-payments safeguard.

The impact on trade volume is ambiguous depending on the types of disasters, the income level of the country (Phutaworavong, 2014, p. 98) and other exogenous factors. Since 2015, exogenous factors directly impacted the Ecuadorian economy, affecting the level of the trade balance: the appreciation of the dollar, the depreciation of the currencies of the countries of the region, and the unstable behavior of the oil price (Cassinelli, 2017, p. 9). In this context, since that year, Ecuador adopted a series of economic measures, including the implementation of a balance-of-payments safeguard, to control the exit of currencies and help to sustain the dollarization system (Cassinelli, 2017, p. 17).⁹

In January 2016, through Resolution 001-2016 of the Committee on foreign trade (COMEX), Ecuador reduced to 40 the subheadings taxed with the tariff surcharge of 45% (Cassinelli, 2017, p. 17). However, "mainly due to the negative effects caused by the earthquake in the coastal area and whose damages were estimated to exceed 3% of GDP" (Cassinelli, 2017, p. 17), Ecuador resolved to eliminate the 5% tariff surcharge level (mainly raw materials and capital goods) and postponed the execution of the next stage of the remaining schedule for April 2017. Nevertheless, the impact of the disaster on the GDP was finally by - 0.7%. (INEC, 2017, p. 202).

According to data from the National Customs Service, Ecuador's non-oil imports registered a reduction in total from March 2015 to December 2016 compared to the same period of the previous year amounts to USD 7,199 million (-21%), of which, the reduction of imports with safeguard was USD 5,115 million (-40%), and the reduction of imports without measure was USD 2,084 million (-10%) approximately (Cassinelli, 2017, p. 18). Nevertheless, the report did not explain the reasons for this reduction; neither, the report did not relate the reduction with the earthquake. Moreover, the collection for safeguard concept in the period March 2015 to December 2016 was approximately USD 1,447 million (Cassinelli, 2017, p. 18).

⁹ Under the World Trade Organization (WTO) legal framework, in March 2015, the Ecuadorian Government applied a balance of payments safeguard measure consisting of the application of tariff surcharges to 32% of total imports and 6.9% of the national supply of goods and services (Cassinelli, 2017, p. 17).



On the other side, in July 2016, through Resolution 015-2016 of the COMEX, the Ecuadorian Government resolved to exclude from the measure identification earrings of imported cattle, benefiting the industry located in an area affected by the earthquake (Cassinelli, 2017, p. 17). This resolution evidences the reactive and erratic measures that the Ecuadorian Government adopted on the first resolution after the earthquake due to the lack of well-functioning institutions.

In October 2016, the Resolution 21-2016 of the COMEX resolved to reduce the surcharge levels of the safeguard measure due to the signs of improvement in the macroeconomic situation of the country and in particular, to the positive balance of the trade balance recorded in the first semester of 2016. This decision implied that the balance of payments safeguard measure has only two levels of tax (15% and 35%), covering around 2,152 of the sub-items. In a meeting held on November 28, 2016, in the framework of the balance of payments safeguards measure consultation process, the Balance of Payments Restrictions Committee of the World Trade Organization (WTO) resolved by consensus to continue the analysis of the measure in a next appointment. The decision implied the continuity of the safeguard measure with the coverage of the multilateral organization (Cassinelli, 2017, p. 18).¹⁰

Besides the exogenous factors, which require a more specific and more in-depth study, the Ecuadorian trade policy was very reactive in front of the earthquake, and it did not seem to be well-established and permanent. The Ecuadorian Government implemented safeguards in 2015; actually, the 2016 disaster was the main reason for postponing the elimination of the safeguards for several times. These kinds of reactive policies do reflect numerous inaccuracies, which require corrections from the Governmental policy on international trade.

¹⁰ During 2016, the macroeconomic and commercial periodic evaluations of the financial performance of the Safeguard Measure by Balance of Payments had to be sent to the General Secretariat of the Andean Community (Cassinelli, 2017, p. 18).



Other trade measures adopted by the Ecuadorian Government.

The Ecuadorian government also adopted a law,¹¹ which allowed the importation of capital goods. Ecuador also implemented a project for internationalization (exportation) of local companies, for the area affected by the earthquake. As Phutaworavong (2014, p. 97) says, middle-income countries could import new machinery and equipment for restoration and rebuilding. Therefore, disasters provide an opportunity to update the capital stock and adopt new technologies (Phutaworavong, 2014, p. 98).

In accordance to article 12 of the Organic Law of Solidarity and Citizen Co-responsibility, a resolution of the Ecuadorian Committee on foreign trade established a global quota for the importation of capital goods not produced in Ecuador for the benefit of persons or companies from the provinces of Manabí and Esmeraldas that were affected by the earthquake (Cassinelli, 2017, p. 49). Additionally, the Ecuadorian Government implemented a project in order to promote the creation of new exporters and consolidate existing ones, focus on micro, small, and medium enterprises. The term of execution of the project was from June 2016 until December 2018 (Cassinelli, 2017, pp. 37-38). Specifically, within the framework of the Productive Reactivation Plan for the areas impacted by the earthquake the government visited some companies domiciled in the provinces of Manabí and Esmeraldas, in order to support them for exporting their products. Eighteen companies from Manabí and Esmeraldas received advice from the Ministry of International Trade team (Cassinelli, 2017, pp. 37-38).

Conclusions

It seems complicated to establish a direct relation between a disaster and the international trade of a country because many exogenous factors also impact local economies. Nevertheless, this research allows establishing some hypotheses, which the following researches should contrast. Governance and well-functioning institutions are conducive to an economy, which could be

¹¹ Chile adopted a Law for the reconstruction (Ley N° 20.455, Published the 31st of July, 2010. Nevertheless, this Law did not establish any regulation related to the international trade sector.



resilient towards disasters. Commercial Agreements could be considered well-functioning institutions because the demand for export products could increase in other markets, with a country has commercial agreements. Then, countries with liberal international trade policy, opened with free trade agreements, could be more resilience than an economy that is more closed to international trade and with a limited number of commercial agreements.

Ecuador adopted a protectionist policy through a balance-of-payments safeguard. This country had a reactive international trade policy in front of disasters, adopting a law for promoting the importation of equipment, and particular policies for the internationalization of companies from the region affected by the earthquake. In the case of Chile, even the earthquake affected the production, the national economy grown concerning the previous year. Chile did not adopt any restrictions to its importations, such as safeguards. Neither, this country adopted a policy for the promotion of the exportation. The main destiny of their products was countries that have free trade agreements with Chile. On the other hand, the reconstruction law in Chile did not have any regulation related to international trade, probably due to the trade agreements that have already signed.

As part of the recovery phase, Ecuador adopted some legal measures in order to promote exportation and production. The effectiveness of the results of these policies requires further research and analysis. Even the Ecuadorian law approved after the disaster seems to be an opportunity; this also appears as something limited to a certain period, it is too reactive. Also, further research is required on how derogations or exemptions should operate in a disaster.

The demand for exports allows recovering the economy of a country after an internal catastrophic event. Commercial agreements spread the risk. Therefore, trade agreements, as well-functioning institutions, could help to an economy, which could be resilient towards disasters. Nevertheless, markets opened to free trade must implement other protective measures, such as insurance policies, in order to confront the spread risk from an external catastrophic event.



Data is fundamental for decision making. Chile`s reports expressly detail which sectors were impacted by the earthquake. This information allows having good governance. In the case of Ecuador, the information related to the earthquake seems to be very limited, only the report of the INEC detail that shrimp was affected by the earthquake.

After a disaster, exports may be severely affected while imports may be or not. Therefore, there could be a direct relation between disasters and exports, but not between disasters and imports. This research focused more on the state of exports. Another study could deepen the analysis of imports.

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Authors' Biography



Hugo is a Professor of Law and International Relations at Universidad San Francisco de Quito, Ecuador. He is a visiting professor at Universidad Andina Simón Bolívar and Universidad de Especialidades Espíritu Santo. Hugo is a Ph.D. candidate in law at the World Trade Institute, University of Bern. Hugo holds an LL.M. in International and Comparative Law, George Washington University, United States; an MA in International Relations with a minor in Security and Human Rights, Facultad Latinoamericana de Ciencias Sociales; a Specialisation in International Environmental Management, Universidad Central del Ecuador; and his LLB was from Pontificia Universidad Católica del Ecuador.