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"GROWTH CONSTRAINTS AND EXTERNAL VULNERABILITY IN ARGENTINA"

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ABSTRACT

This paper describes the balance-of-payments dominance as a growth constraint to the Argentinian economy and briefly characterizes the unbalanced productive structure of the country as its main cause. Also, understanding that under this constraint domestic economic cycles depend on external shocks, auto-regressive vectors are used to characterize the short-run impact of these shocks on GDP, trade balance, and real wages.

Results confirm that there is a bottleneck in the trade balance that blocks future growth possibilities, that GDP and wages are highly sensitive to variations in the terms of trade, that the increase in external debt does not produce economic growth or improvements in the purchasing power of the population, and that there is a vicious dynamic between capital flight and foreign debt. At the same time, there is evidence of the increase in external vulnerability since the change in the accumulation model in the 1970s.

Key Words

Growth constraints; External vulnerability; Vector autoregression; Argentina

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1. INTRODUCTION

During the last decades, Argentina has grown slowly and discontinuously. The different accumulation regimes that followed each other have not managed to channel the country into a sustainable development path. Several authors argue that economic recessions in Argentina are directly related to the balance of payment (BoP) problems. From works like Diamand (1983) and Azpiazu & Nochteff (1995) to more recent ones like Lavarello *et al.* (2013), Schteingart (2016), Abeles & Valdecantos (2016), Gerchunoff & Rapetti, (2016), and Basualdo (2017), the common factor in the explanation is an external constraint.

This growth constraint is explained by an unbalanced productive structure, which leads recurrently to a shortage of foreign currency (Diamand, 1983). During the state-led industrialization phase (1930-1975), Argentina had a primary sector that worked at international costs and was a foreign exchange provider, and an industrial sector, whose costs were higher than international ones and permanently demanded foreign currency to expand, since many productive inputs and capital goods were not produced locally due to the limited depth of the substitution process and the country's technologically adaptive behavior.

Thus, every time the country grew, it inexorably entered into a trade balance deficit, which led to a BoP crisis (Schteingart, 2016). This process worsened via the capital account from the 1970s onwards when Argentina entered into a dynamic of external indebtedness that involved allocating more and more foreign currency to debt repayment (Ocampo, 2016; Basualdo, 2013). Moreover, the bottleneck worsened with capital outflow, which escalated from the 1990s.

Faced with this type of growth constraint and the defenselessness it generates, the stress that comes from foreign economies become more relevant. Furthermore, Ocampo (2016) makes explicit the dependence of domestic economic cycles on external shocks - i.e., the influence of the BoP on the short-term macroeconomic dynamics of developing countries. Studies that characterize Argentina's external vulnerability identify the channels through which it is related to its growth, highlighting trade specialization and financial relationship. In this sense, variations in the terms of trade, in the growth of the main trading partners, and the evolution of external liabilities, take on vital relevance (Abeles and Valdecantos, 2016).

Therefore, this work aims to characterize Argentina's growth constraint and describe the short-run impact of external shocks together with certain endogenous dynamics with which they are related. Furthermore, considering that in the 1970s a new accumulation model was established, this work also pursues the objective of comparing external shocks' impact between the periods 1930-1976 and 1977-2018.

For these purposes, vectors autoregression (VAR) are estimated, which provides a systematic way to capture rich dynamics in multiple time series (Stock and Watson, 2001). VARs are very useful when there is evidence of simultaneity between a group of variables, and when their relationships are transmitted over time. This is the case of the interrelationship between Argentina's main trading partner's growths, the country terms of trade, the level of external public debt and capital outflow, and its impact on the trade balance, output, and real wages. The fact of including real wages in the analysis is a distinctive element of this work when comparing to others that study similar issues, and responds to the objective of knowing the impact of the shocks on the purchasing power and the population standard of living.

The study of Argentina's vulnerability acquires greater relevance in the current context: in 2020, the country is going through its third consecutive year of recession, its ninth sovereign debt renegotiation and a greater concentration of its export basket in primary products, as warned by ECLAC (2020). Currently, it is also refinancing the loan that IMF provided in 2018, the largest loan package the institution has ever given (IMFc, 2020).

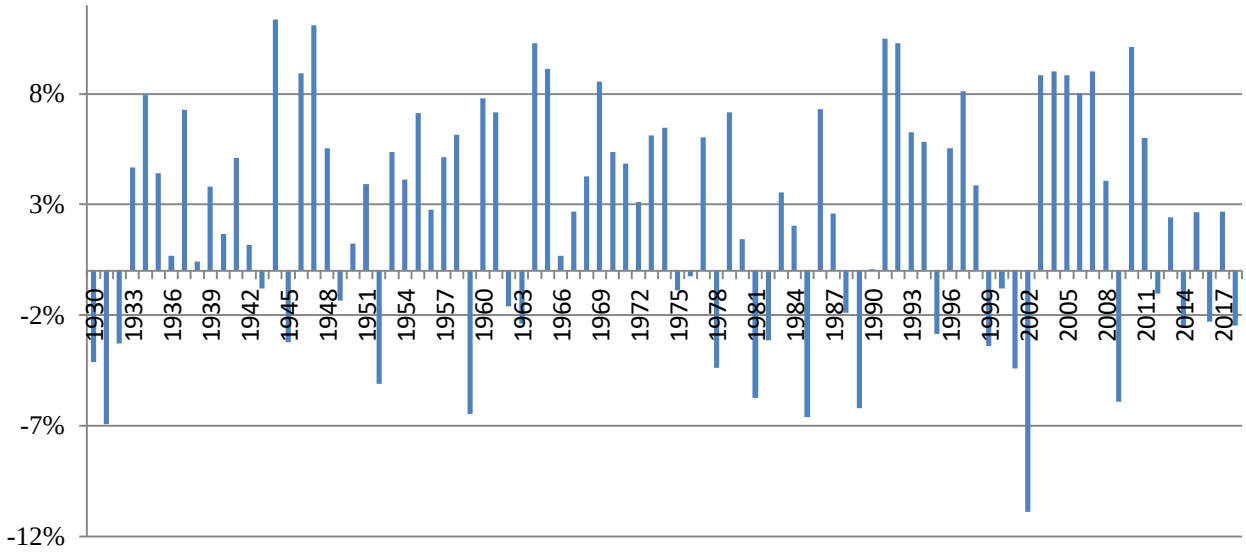
The remainder of this thesis is organized as follows: Section 2 offers a brief review of the existing literature on the external growth constraint in Argentina and the unbalanced productive structure. Also, some measures that allow characterizing it are included. Section 3 contains a description of variables that represent the channels through which external shocks impact the economy and the arising hypothesis. In Section 4, the research methodology is outlined by explaining the data and the vector autoregression. Results are presented in Section 5, both for the whole sample and for the comparison between sub-periods. Finally, Section 6 presents conclusions.

2. GROWTH CONSTRAINTS IN ARGENTINA

2.1. Argentina's slow and discontinuous growth

Not only Argentina has failed to enter a path of sustainable growth and development, but it has moved further and further away from it. From 1930 to the present, the Argentinian economy has grown for more than five consecutive years in only four periods: 1933-1942, 1953-1958, 1964-1974, and 2003-2008. From 1930 to 2018, the country has experienced 19 recessive episodes that account for 28 years of economic contraction: more than one recession every three years.

Figure 1: Argentina GDP growth rates



Source: own elaboration with Maddison Project database

Figure 1 shows the volatility of Argentina's growth and, in turn, the increasing intensity of recessionary episodes between 1930 and 2018. However, it is important to note that this is not the usual behavior of South American emerging economies. Table 1 and Figure 33 (Appendix) show that the Argentinian case is different from that of Brazil, Uruguay, Chile, Colombia, Peru, and Bolivia. The performance of these economies is more stable, their recessive episodes are recorded less frequently and their average accumulated growth rates are higher. Moreover, Argentina experiences the second worst drop in growth rate between the two sub periods being compared.

Table 1: Average accumulated GDPpc growth rates (%) and number of years of economic contraction South American economies

Country	Average accumulated growth rate			Number of years of economic contraction (1930-2018)
	1930-2018	1930-1976	1977-2018	
Brazil	2,44	3,67	1,01	22
Colombia	2,04	2,03	2,06	15
Chile	1,91	0,75	3,14	21
Peru	1,68	2,07	1,34	25
Uruguay	1,41	0,87	2,06	26
Bolivia	1,14	1,35	0,87	24
Argentina	1,13	1,51	0,66	28

Source: own elaboration with Maddison Project database

There are different approaches to explain the deterioration of the Argentinian economy. Some attribute responsibility mainly to the weight of the public sector and the fiscal deficit (Buera & Nicolini, 2019; di Tella & Dubra, 2010; Amado *et al.*, 2005), while others focus on the lack of a healthy currency and the difficulty of capturing domestic savings (Taylor, 2018; Fanelli & Heymann, 2002). The institutionalist approach relates these explanations and argues that the country has an organizational framework that inhibits its future growth possibilities (Acemoglu *et al.*, 2003; Della Paolera & Taylor, 1999). Furthermore, some believe that the economy's main problem has been its inability to grow without facing an external constraint. Far from considering these explanations as mutually exclusive and from aspiring to monocausal elucidations, this paper focuses on the approach of the external constraint and the consequent relevance of the vulnerability to the rest of the world.

2.2. External constraint and its causes

The external constraint approach was first formalized by Thirlwall (1979). The author argues that the main constraint on an open economy to achieve a high growth rate in the long term is its Balance of Payments (BoP). Strictly speaking, Thirlwall's Law holds that the growth rate of open economies approaches the growth rate of the ratio of export growth to the income elasticity of imports. As proven in several studies this model approximates well the growth dynamics followed by Argentina (Gómez *et al.*, 2007; Capraro, 2007).

In the same theoretical strand, in his article entitled "The Argentinian Pendulum: Until When?" Diamand (1983) describes the political-economic cycle of the two currents that alternate in the government and concludes that none of them is intrinsically viable. He argues that both converge, in different ways, towards recurrent BoP crises. The author describes an "expansionist" or "popular" political model that aims at progressive income distribution and full employment, and whose main policy instruments are the

provision of public goods, nominal wage increases, price controls, exchange rate manipulation, and public service tariffs.

On the other hand, there is the “political-economic orthodoxy”, which has as its main objective the attraction of foreign capital and emphasizes discipline, order, efficiency, and budgetary balance. Both currents converge cyclically, in different ways, to BoP crises. Nevertheless, it is the latest the one that more frequently incurs unsustainable debt processes that imply the commitment to pay interest in foreign currency, which increases its demand and accentuates the “original sin” dynamic[1] (Eichengreen and Hausmann, 2010). This contributes to the "stop and go" behavior of the economy, through which the path of growth itself generates the conditions for a crisis, after which the march of the product is resumed (Schvarzer & Tavonanska, 2008).

What is the underlying reason that makes the two political currents that lead the country to arrive at these types of crises? According to Prebisch (1949), recurrent BoP crises can be explained by the problem of the Structural Heterogeneity, which exposes that productive sectors typical of economies in different stages of development coexist in Argentina. This thesis is analogous to that of Diamand's Unbalanced Productive Structures (1983), Azpiazu and Nochteff's Heterogeneous Productivity Structure (1995), or Schydlowsky's Evolutionary Dutch Disease (1993).

The main characteristic of this phenomenon is that "there is a discrete gap between the productivity of the sector with the greatest comparative advantage and that of the sector with the greatest comparative disadvantage (or higher marginal costs, or lower marginal productivity)" (Schydlowsky, 1993). It is important to note that this type of imbalance cannot occur under free trade, since the existence of a sector with the greater comparative disadvantage is a necessary condition. In our case of analysis, the industrial sector, born during the Industrialization by Imports Substitution stage (ISI), suffers from a low enough effective exchange rates to make it difficult to compete with imports. Indeed, the "industrial exchange rate" (in Diamand's jargon), or Schydolowsky's analogous version, "the cost parity of the industrial sectors", requires a greater depreciation than the cost parity of the primary sectors.

[1]Eichengreen and Hausmann (2010) name “original sin” the phenomena of a country that, not being allowed to borrow abroad in its own currency, accumulates a net debt such that it generates an aggregate currency mismatch on its balance sheet. Authors show that the extent to which debt is denominated in foreign currency is a key determinant of output stability and capital flows´ volatility.

Azpiazu and Nochteff (1995) explain that one of the causes of the Structural Heterogeneity in Argentina is the historical process of local inputs integration and productive diversification. The productive structure formed during the first part of the ISI (1930-1975) worsened the comparative disadvantages of the industrial sector, through a protectionist bias that failed to properly encourage industrial exports. According to these two authors, the process of industrialization carried out was consistent with an adaptive economy, with technologically late-growth, in which there are no transformations and expansions of endogenous impulses but rather adaptations to exogenous impulses. The type of protectionism applied at that time was the most useful for the economic elite of that time and the least convenient for long-term economic development.[2]

This is important because these two productive sectors are different in terms of their potential to generate growth and development. On the one hand, manufacturing sectors, generally add more value. This implies high increasing returns, high incidence of technological change and innovations, and high synergies and linkages arising from labor division and, therefore, strongly induce economic development. On the other hand, low value-added sectors typical of poor and middle-income countries have low R&D content, low technological innovation, and the absence of learning curves (Reinert, 2010). Consequently, Argentina's possibilities in the future are undermined.

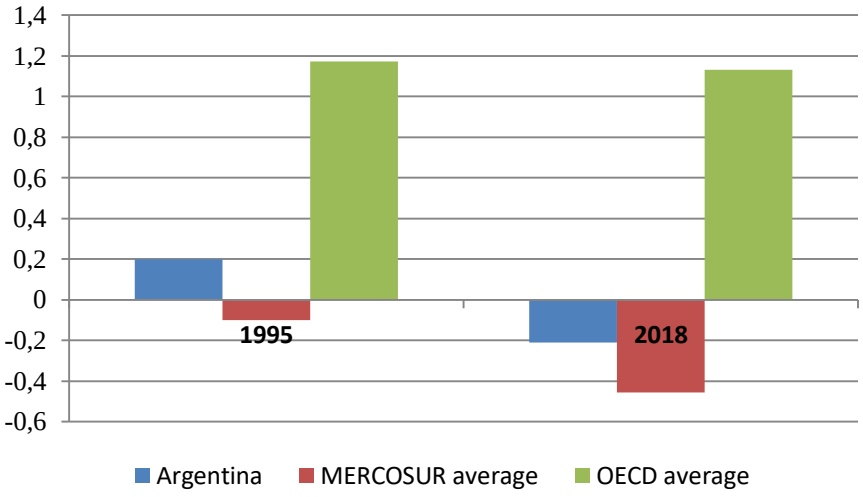
Also, Gala *et al*. (2018) argument that exports and production complexity is significant to explain convergence and divergence among countries. To acknowledge this, they use the Economic Complexity Index (ECI), a reflection of the diversification and ubiquity

[2] These authors make an analysis of the possible economic policy options that the map of social actors allowed at that time. They conclude that the politically and socially viable options were the "industrial export" and "protectionist" ones. The industrial export option, adopted by the Southeast Asian economies, implied combining various instruments with the objective of inducing a sustained increase in industrial exports. In the industrial field, the protectionist option simply involved protecting industry in the domestic market but not encouraging it to export.

of countries' export basket[3]: the higher the economic complexity of a country, the better its possibilities to stimulate faster growth rates.

According to the Atlas of Economic Complexity (2011), Argentina is in the 73rd position out of 133 considered countries (2018 data), and it has become less complex during the last 23 years (1995 is the first year for which the ECI is available), worsening 21 positions in the ECI ranking. The country is expected to grow slowly, as it is less complex than expected for its income level. As can be seen in Figure 2, Argentina has the largest fall in economic complexity compared to the falls in MERCOSUR and OECD averages.

Figure 2: Economic Complexity Index
Argentina, MERCOSUR average & OECD average - 1995&2018



Source: own elaboration with data from the Atlas of Economic Complexity (Hausmann et al, 2011)

In Table 2, we can observe closely the low diversification of Argentinian exports that persists at present. The concentration in primary products represents more than 60% of the total value of trade. Moreover, ECLAC (2020) alerts that the current economic crisis due to COVID-19 and the consequent quarantines has intensified the concentration of the regional export basket in primary products.

[3] Non-ubiquitous goods can be divided into those with high technological content, which are difficult to produce (airplanes), and those that are highly scarce in nature (diamonds). To control for scarcity in nature, the ECI compares the ubiquity of the product made in a given country with the diversity of the exports of countries that also produce and export this good. Therefore, non-ubiquity with diversity means "economic complexity" (e.g. Japan produces X-ray equipment, something non-ubiquitous, and the country's export basket is highly diversified) while diversity without non-ubiquity means lack of economic complexity (e.g. fish, meat, fruits are ubiquitous goods that are part of diversified export baskets typical from Latin American countries). Moreover, non-ubiquity without diversity means lack of economic complexity (Botswana produce and export diamonds, but its exports are undiversified).

Table 2: Trade value by sector – 2018

Sector	Relative weight in exports (%)
Vegetable Products	26,61
Foodstuffs	22,41
Transportation	11,71
Animal Products	9,59
Metals	7,74
Chemicals & Allied Industries	7,49
Mineral Products	6,28
Machinery & Electrical	2,16
Products Plastics & Rubbers	1,99
Raw Hides, Skins, Leather & Furs	1,46
Wood & Wood Products	1,00
Textiles	0,98
Miscellaneous	0,39
Total	100

Source: own elaboration with data from The Observatory of Economic Complexity

The Structural Heterogeneity thesis has been reinforced in more recent literature, with some variations. Gerchunoff and Rapetti (2016) explain that Argentina faces a structural distributive conflict that was born in the period 1930-1950. It is defined as the discrepancy between wage aspirations of workers and the wage associated with the productive possibilities of the economy, the latter being limited by the stagnation of the agricultural supply and by the low contribution of the manufacturing industry to the generation of foreign currencies[4]. Causes of the birth of this phenomenon can be found in the fall of the export value and capital outflows between 1930 and 1952, together with the new distribution pattern and the notion of social justice that were later introduced by Peronism[5] (Gerchunoff and Rapetti, 2016). Following their theoretical proposal, this work analyzes Argentina's external vulnerability starting in 1930.

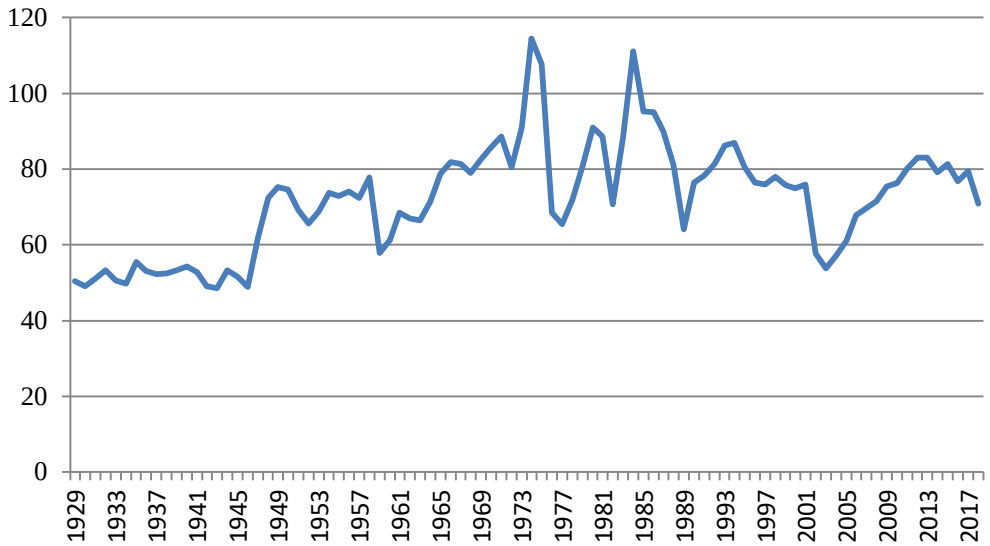
As can be seen in Figure 3, from 1945 onwards a tendency towards an increase in the real wage began, whose peak was reached on the eve of the military dictatorship (1976-1983). In line with what Gerchunoff and Rapetti indicate, in that time the real wage perforated a ceiling from which it would no longer fall, at least until the 2001/2002 crisis.

[4] Authors also present the structural distributive conflict as the divergence between two levels of the real exchange rate (RER): the macroeconomic equilibrium RER, which allows the economy to simultaneously maintain full employment and a sustainable balance of payments, and the social equilibrium RER, which emerges when fully employed workers reach the real wage they aspire to. Imbalance occurs when the macroeconomic RER is significantly higher than the social equilibrium RER.

[5] Juan Domingo Perón was the founder of the Peronist movement. He was president of Argentina for three terms: 1946-1952, 1952-1955, and 1973-1974.

In this paper, real wage will be used as a measure of aspects that GDP fails to represent on the economic and social aspects: it approximates the purchasing power and material welfare, which are part of the population quality of life. Greater purchasing power reflects access to more goods and services, which implies a higher standard of living for the worker and his/her family. Likewise, the higher the real salary is, the lower the levels of income inequality are (Castro *et al.*, 2019).

Figure 3: Real Wage Index



Source: own elaboration with Fundación Mediterránea, Graña y Kennedy (2008) & INDEC[6] database

In addition, the dynamics of external strangulation generated by the unbalanced productive structure have been accentuated since the change in the accumulation model[7] in the mid-1970s, from which the capital account acquired a central role in generating cyclical shocks in emerging economies (Ocampo, 2016). The 70s were characterized by profound changes at the global level: the decline of the strong growth of the Second Postwar in developed economies, the abandonment of the gold standard, the oil shocks of 1973 and 1979, and financial markets progress.

Figure 4 shows that Argentina was plunged into a strong process of indebtedness that involved allocating more and more foreign currency to debt repayment (the "original sin" problem) while destroying the industrial fabric established during the previous

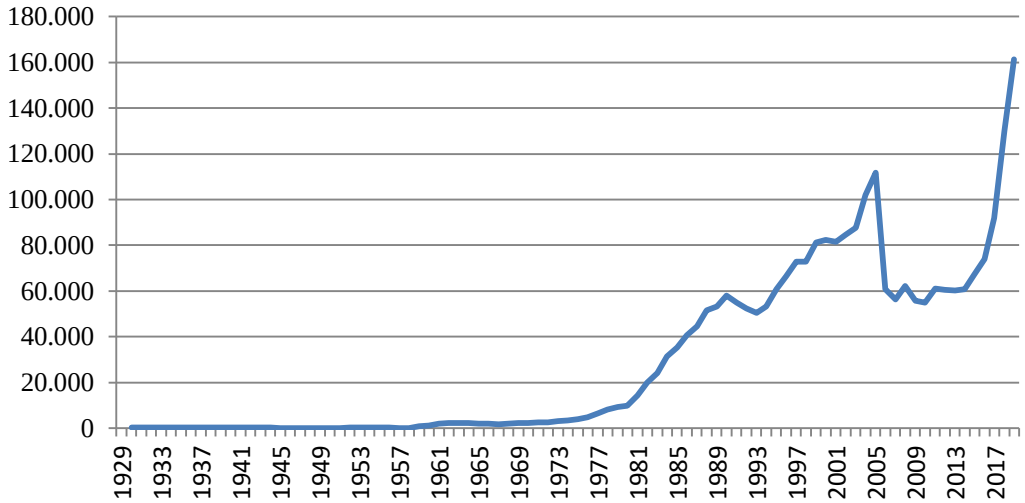
[6] INDEC is the Argentina's National Institute of Statistics and Census

[7] It is followed the definition of Boyer (1989) of the accumulation model: "the set of regularities that ensure the general and relatively coherent progress of capital accumulation, that is, which allow the resolution or postponement of the distortions and disequilibria to which the process continually gives rise".

regime (Basualdo, 2017). In other words, during this period a new capital-account bottleneck was added to the traditional trade balance constraint (Ocampo, 2016).

A policy that contributed to the accumulation model transformation was the Financial Reform of 1977, which aimed for the liberalization of the internal markets and greater involvement with international markets[8]. It negatively affected productive activities, encouraged speculative valorization, and produced hypertrophy in the financial sector (Rapoport & Guiñazú, 2016).

Figure 4: Public External Debt in millions of dollars[9]



Source: own elaboration with Ferreres (2005), Basualdo (2013), and ECLAC data

It is worth highlighting the implications of the fact that the commodities that Argentina historically sells to the world are food. Within the theoretical framework of external constraint, Chena (2008) makes explicit that, even if the income elasticity of demand for exports increases and becomes equal to the demand for industrial imports, the country will continue to lag behind its trading partners in terms of the role played in its growth by the income elasticity of domestic demand for food. In countries with high levels of poverty, the income elasticity of the internal demand for food is high. This means that, even if the terms of trade improve, the country will suffer an external constraint.

The seriousness of Argentina's external vulnerability has become even more evident and urgent in the last year when the level of external debt put its sustainability in check.

[8] The laws that comprised the Financial Reform were 21.495 and 21.526; along with 21.364, 21.547 and 21.571, which modified the BCRA's statute. For more details on the subject, see Cibils & Allami (2010) and Gaba (1981).

[9] No data are available for Argentina's total (public + private) external debt for the period 1930-2018. Such information is only available from 1970 onwards.

Given the deterioration of the balance of payments, the International Monetary Fund itself has accepted as valid the exchange controls that the country imposed in 2019, in a new reading of the current situation (IMF, 2020a; IMF, 2020b).

3. EXTERNAL VULNERABILITY

3.1. Background

Argentina's vulnerability has two sides: one internal and one external. So far, the internal side has been described, which is the unbalanced productive structure and its consequent effects on Argentina's growth possibilities. This implies "defenselessness, meaning a lack of means to cope without damaging loss" (Chambers, 1989). Faced with external shocks, the country has less capacity to deal with risks without falling into a BoP crisis or, even if it does not fall into a crisis, it may have less capacity to restore growth in recessive international contexts. This, in turn, affects the level of investment and further compromises future growth possibilities.

On the other hand, the external side of vulnerability alludes to risks and stress to which the economy is exposed. Abeles and Valdecantos (2016) classify the channels through which external shocks affect the economy into two types: real and financial. The former refers to those determined by movements in the terms of trade and the variation of main trading partner's growth, while the financial ones refer to fluctuations in the levels of external liabilities.

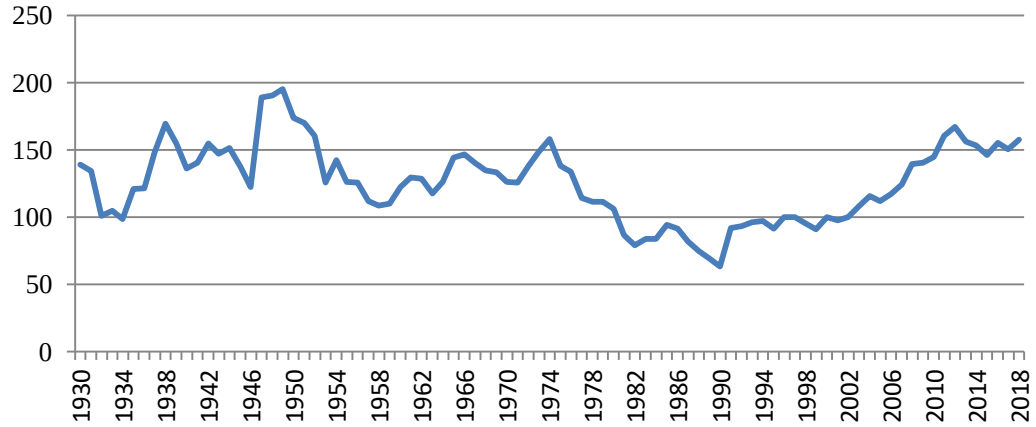
In this way, real external vulnerability is strongly correlated with the trade specialization of each country: in the face of a lower degree of productive diversification, the economy will be more exposed to dynamics unrelated to its functioning, especially in the terms of trade movements. In fact, we can observe that the periods in which the terms of trade (TOT) fall most sharply coincide with years of internal economic turbulence (Figure 5). During the period 1930-1933, TOT worsened considerably, contributing to the genesis of the structural distributive conflict.

Following the identification and classification of economic crises in Argentina by Amado *et al.* (2005), we can find a correlation between some of these and the falls in

the Terms of Trade[10]. It is the case of TOT's dramatic fall between 1947 and 1958, which coincide with a period of 4 crisis: 1948-1949 (deep), 1950-1951 (mild), 1955 (mild), and 1958 (very deep). The other substantial drop in the terms of trade occurs for the period 1974-1989, which coincide with the crisis 1975-1976 (very deep), 1981-1982 (deep), 1983-1989 (very deep).

Following Charnakovi and Dolado (2014), TOT affect small commodity-exporting economies in different ways. The "external balance effect" refers to a direct relation between TOT and current account balances: it is expected that when exports relative prices go up, revenue from exports surpasses the costs of imports, leading to the increase of foreign assets or a decrease of external debt. In addition, the "commodity currency effect" refers to the expectation of an inverse relation between TOT and real exchange rate (appreciation). The "spending effect" points that TOT shocks boost domestic demand by increasing consumption, investment, and government expenditure.

Figure 5: Argentina's Terms of Trade – 1930-2018



Source: own elaboration with Gerchunoff & Llach (2003) and ECLAC data

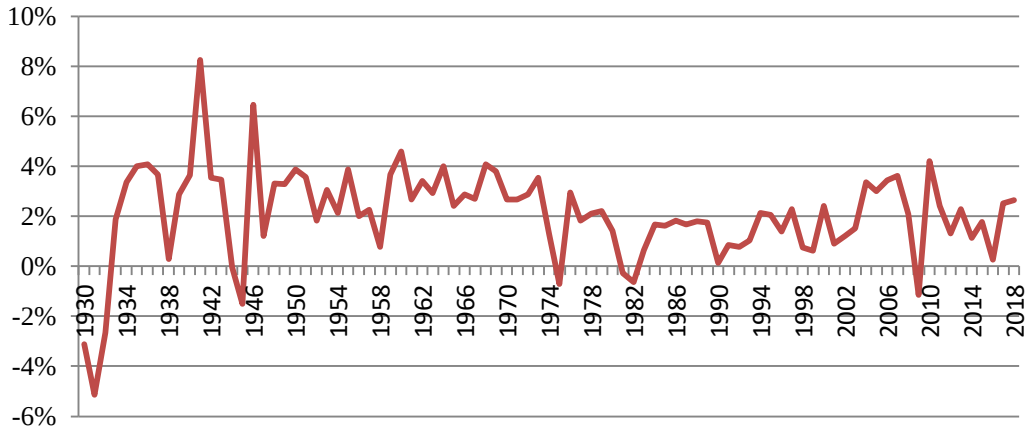
Regarding Argentina's trade partners' growth, Abeles & Valdecantos (2016) explain that the more the country concentrates its export destinations on a few trading partners, the greater its external vulnerability. To acknowledge this type of vulnerability, the growth rate of the main trading partners weighted by exported value in each year is taken into account. Two criteria were followed to build the variable: represent at least 50% of exports in each year -the average is 78,9% for the entire period- and include at

[10] Depending on the deviation from the Market Turbulent Index (MTI) -that is the sum of the change rate of international reserves, exchange rate and interest rate weighted by the inverse of their variability Amado *et al.*(2005) classifies Argentinian crisis in very deep (or crashes), deep and mild. MTI follows the idea that market pressure increases when exchange rate devaluates (rises), when interest rate increases and when international reserves fall.

least the first 14 export destinations of the corresponding year (see Figure 34 in the Appendix).

Figure 6 shows that years of substantial fall in Argentina's main trading partners economies coincide with internal crisis: 1930-1931, a period of deep international crisis; 1937-1938, a mild internal crisis; 1948-1949, a deep crisis with a depreciation of 247,4% of the exchange rate; 1958, a deep crisis that implied 78% drop in the international reserves; 1975-1976, very deep crisis with 2.282,1% depreciation of the exchange rate (a hinge in the type of crisis that the country used to have) and 80,9% drop of the international reserves; 1981-1982, a deep crisis with 2.999,3% depreciation in that year; 1889-1990, the deepest crisis of the considerate period, with uncontrolled increases in the exchange rate (68.935,6%), interest rates and huge reserves loses; and 2008-2009, the international financial crisis (Amado *et al.*, 2005).

Figure 6: Main trading partner's growth rate weighted by exported value



Source: own elaboration with data from INDEC and Maddison project database

As for external financial vulnerability, it depends on the degree of external indebtedness, including the degree of penetration of Foreign Direct Investment (FDI) and the foreign capital flows (Abeles and Valdecantos, 2016). As mentioned above and as can be seen in Figure 4, from the 1970s onwards the external debt increased dramatically. According to Basualdo (2013), this behavior responds to a new social regime of capital accumulation based on financial valorization, defined as the large firms' placement of surplus in various financial assets (securities, bonds, deposits) in the domestic and international markets, to the detriment of real productive investment which is less profitable. Financial internationalization took shape with the deregulation of capital markets implemented by developed economies while in Argentina this was in

line with the economic model implemented by the *de facto* government of the military dictatorship.

Regarding the FDI, Abeles and Valdecantos (2016) argue that it should be taken into account when analyzing the external vulnerability because, despite certain positive attributes FDI has *vis- à -vis* other sources of external financing, it implies a certain return that compromises the availability of foreign currency over time. Nevertheless, FDI is excluded from the VAR analysis in the fifth section of the thesis because of information availability and particularities of the FDI in Argentina. As for the first motive, there is no data about the FDI for the period 1930-1969, not even in secondary sources.

The main reason why Abeles and Valdecantos (2016) consider FDI among the liabilities of Latin American economies is the high level of FDI compared to the size of the economies in Central America and the Caribbean. However, as can be seen in Table 3, the case of South American countries, and particularly the Argentinian case, is very different as there is a lower level of FDI penetration. For Argentina, this means less exposure to external shocks related to sharp increases or decreases in FDI flows.

Table 3: Foreign Direct Investment over GDP - Average per decade [11]

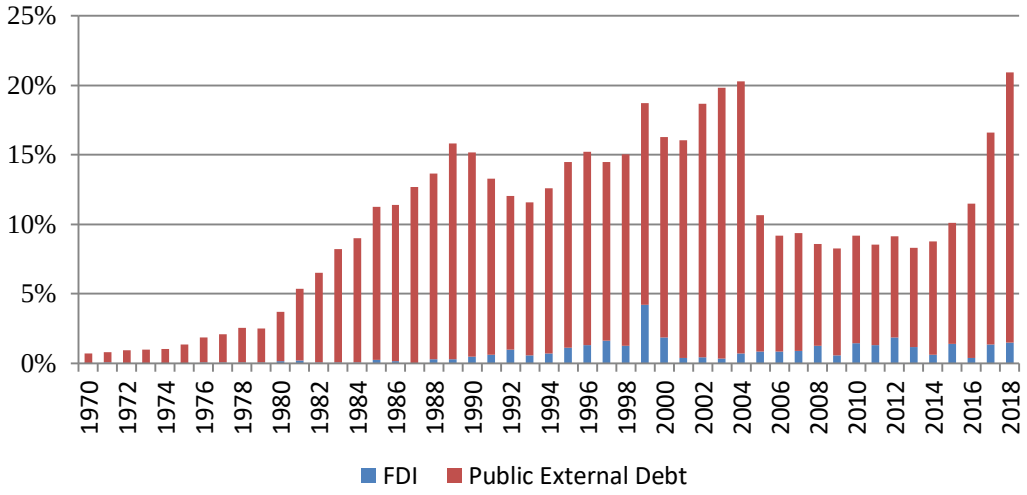
	1970-1979	1980-1989	1990-1999	2000-2009	2010-2018
Caribbean	5,59%	4,20%	5,38%	9,31%	7,43%
Central America	7,06%	1,12%	2,25%	4,55%	4,22%
South America	0,89%	0,71%	2,56%	3,24%	3,18%
Argentina	0,25%	0,61%	2,39%	2,08%	1,81%

Source: own elaboration with UNCTAD data

Figure 7 shows the low relative importance of FDI *vis-à-vis* public external debt in Argentina: in the year of highest FDI penetration, 1999, it accounted for 4,22% of GDP, while public external debt represented 14,2%.

[11] Caribbean includes data from Antigua and Barbuda, Bahamas, Barbados, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago. Central America includes Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico and Nicaragua. South America includes data from Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru and Uruguay.

Figure 7: Argentina's external liabilities as GDP proportion



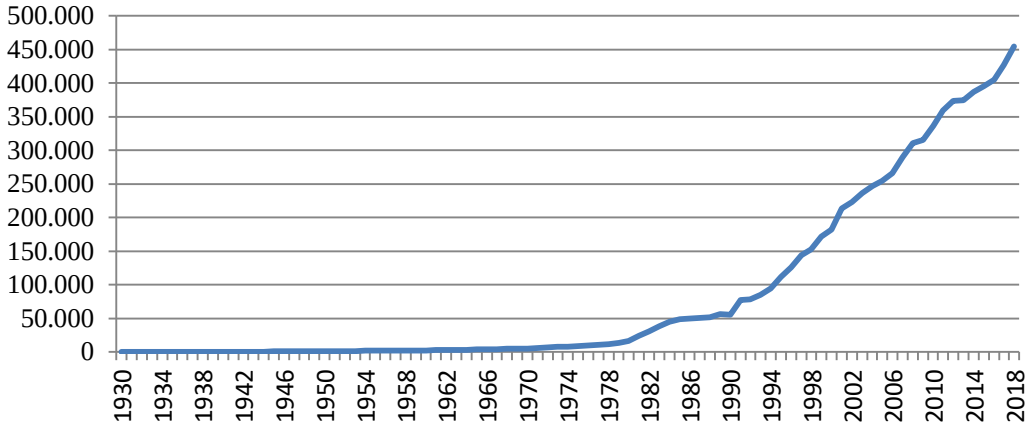
Source: own elaboration with data from UNCTAD

Summarizing, it is clear that in Argentina's case the need for foreign currency to pay the commitments that FDI may entail is of lesser relative importance than in the rest of Latin America and, therefore, the scarcity of information for the period under analysis does not represent a serious problem.

Last but not least, another process that has aggravated the problem of external constraint and that exacerbates the impact of external shocks is capital flight. Basualdo (2013) explains that local capital flight occurs when residents of an economy remit funds abroad to make various investments and acquire assets that may be physical (direct investments) or financial (securities, shares, deposits). Basualdo and Kulfas (2000) describe that the formation of external assets has its genesis in Argentina in the 1970s with the financial reform that set in motion the economic policy of the military dictatorship, but becomes more complex and progressively takes shape from the 1990s onwards, as can be seen in Figure 8.

It should be noted that capital outflow abroad was intrinsically linked to external indebtedness because the latter no longer necessary constituted a form of financing investment or working capital but rather an instrument for obtaining financial income, given that the domestic interest rate was systematically higher than the cost of external indebtedness in the international market. In the context of a structural shortage of foreign currency, external debt made the capital flight possible, by providing the necessary foreign currency (Basualdo, 2013).

Figure 8: Stock of external assets in millions of dollars– (1930-2018)[12]



Source: own elaboration with data from Argentina's Ministry of Finance, Basualdo (2013) and Gaggero, Gaggero, and Rua (2013)

3.2. Hypothesis

Under the consideration that the external constraint has operated during most of the analyzed period, and given the characterization made of the vulnerability to external shocks, it is expected to find evidence in favor of the positive impact on output and real wages of TOT positive shocks and the trade partners growth. Also, it is expected that increases in external public debt negatively impact GDP and real wages, while the same is expected for capital flight shocks. Moreover, it is awaited to find evidence in favor of the strangulation of the trade balance, as well as of the vicious dynamics between foreign debt and capital flight. Besides, external vulnerability is expectable to intensify between the periods 1930-1976 and 1977-2018, i.e., since the change in the accumulation model.

4. DATA AND RESEARCH METHODOLOGY

4.1. Data description

Table 4 includes the labels and definitions of the variables used in the VAR model and the source from which they were obtained (see Table 11 and Figure 35 in the Appendix for descriptive statistics and individual graphs of the variables). The data is annual and covers the period 1930-2018. Since there are no official sources that have the complete series used here, the "backward splicing" methodology has been used to obtain homogeneous series of the variables. The procedure involves "stretching" the most

[12] The capital flight series use the Balance of Payments Residual Method for their calculation

recent series based on the rate of variation of the previous series (Graña & Kennedy, 2008).

Table 4: Variables

Variable	Label	Operational definition	Source
GDP	c_arggdp	Real GDP in 2011millions of USD	Maddison project (2018) & UNCTAD data base
Real wage	c_realwage	Real wage index	*Fundación Mediterránea*, Graña & Kennedy (2008) & INDEC[13] data base
Trade Partners	c_tradepartn	Main trading partners growth rates weighted by the participation of each partner in the export basket of the corresponding year	Ferreres (2005), INDEC & UNCTAD databases
Terms of trade	c_tot	Terms of trade index	Gerchunoff and Llach (2003) and the World Bank database
Balance of Trade	c_tb	Exports minus Imports in millions of USD	Ferreres (2005) & IMF database
External public debt	c_fordebt	Balance of external public debt in millions of USD	Ferreres (2005), ECLAC database, and Basualdo (2013)
Capital outflow	c_ko	Funds remitted abroad obtained by the BoP Residual Method in millions of USD	Argentina's Economic Ministry database, Basualdo (2013) & Gaggero *et al.* (2013)

Considering the dependence of domestic economic cycles on external shocks - i.e., the influence of the balance of payments on the short-term macroeconomic dynamics of developing countries (Ocampo, 2016) - the focus is on the interrelation between the variable's cycles. The Hodrick-Prescott filter is applied to variables for this purpose. It consists of a linear filter that breaks down the time series into two components: the long-term trend and a stationary cycle (the fluctuations around the long-term trend)[14].

Studying a variety of macroeconomic time series, Hodrick & Prescott (1997) found that the nature of the movements of cyclical components is very different from that of slowly varying components. The cyclical part, understood as trend deviations, has approximately zero mean over the long term. This contributes to the stationary nature of the series, which indicates that the probability distributions are stable over time (Wooldridge, 2013).

In her study of Argentinian economic cycles, Cerro (1999) found that the average length of the cycles between 1920 and 1998 is 3,33 years. While the amplitude of the Argentinian cycle phases is greater than in the cases of the US, UK, and Australia, the

[13] INDEC is the Argentina's National Institute of Statistics and Census

[14] The filter requires previous specification of a parameter λ that tunes the smoothness of the trend, and depends on the periodicity of the data. For annual data, as it corresponds in this case, a lambda of 100 is used following the suggested by Hodrick and Prescott (Maravall and del Rio, 2001).

duration is lower, which implies that the country has more cycles per period. This is consistent with Ocampo's thesis regarding the dependence of the domestic cycle on external shocks and the consequent economic volatility.

4.2. Research methodology: Autoregressive vectors

To describe the impact of external shocks and certain endogenous dynamics with which they are related, a VAR analysis is performed with EViews 7. A VAR is an autoregressive vector-type model used to characterize simultaneous interactions between groups of variables. One of the main features of this framework is that it provides a systematic way to capture rich dynamics in multiple time series (Stock and Watson, 2001), and therefore it helps to avoid monocausal and simplistic explanations.

The vector autoregressive for a set of n variables is of the form:

$$A_0\, Y_t = \sum_{j=1}^{n} A_j\, Y_{t-j} + u_t \qquad (1)$$

where Y_t is a $(nx1)$ vector of variables, A_j is a (nxn) matrix that contains the structural coefficients that relate the current and past values of the endogenous, u_t is a $(nx1)$ vector of innovations in each variable, and $E(u_t u'_t) = \Sigma_u$.

We assume that the covariance matrix of the u_t innovations of the VAR model, Σ_u, is diagonal, i.e., the innovations associated to different variables have zero covariance, since the correlation between the different variables is being collected by the presence of each one of those variables in the equation of the other variable in the structural model: $E(u_t u'_s) = 0 \;\forall\; t \neq s$.

To obtain the reduced form (RF) it is necessary to perform the following operation:

$$Y_t = \sum_{j=1}^{n} A_0^{-1} A_j\, Y_{t-j} + A_0^{-1} u_t \qquad (2)$$

which leads to the form that best summarizes the parameters that are searched, i.e.:

$$Y_t = \sum_{j=1}^{n} \theta_j\, Y_{t-j} + \varepsilon_t \qquad (3)$$

where $\varepsilon_t = A_0^{-1} u_t$, $\theta_j = A_0^{-1} A_j$.

Also, $E(\varepsilon_t \varepsilon'_t) = E\left(A_0^{-1} u_t u'_t A_0^{'-1}\right) = A_0^{-1} E(u_t u'_t) A_0^{'-1} = A_0^{-1} \Sigma_u A_0^{'-1} = \Omega$, with Ω being the variance-covariance matrix of the reduced form.

This model could be consistently estimated by OLS regressions equation by equation since endogenous variables are only a function of predetermined variables and do not present endogeneity problems, as they have no correlation with the shocks: $E(\varepsilon_t / Yt; Y_{t-1}; \dots; Y_{t-n}) = E(\varepsilon_t) = 0$.

However, an identification strategy is required to recover the response of the variables to structural innovations. Identifying the model consists of finding numerical values for the elements of the A_0 matrix that defines the transformation $\varepsilon_t = A_0^{-1} u_t$.

The empirical model here is identified using Cholesky decomposition which imposes the restriction that matrix A_0 is lower triangular with unit diagonal elements. This decomposition allows obtaining a transformed model with unrelated innovations and unitary variances. New innovations, v_t, are obtained by keeping the residuals of the regressions of each ε_t innovation over all those that precede it within the ε vector:

$$
\begin{aligned}
&v_{1t} = \varepsilon_{1t}\ , \\
&v_{2t} = \varepsilon_{2t} - \hat{c}_{12} v_{1t}, \\
&v_{3t} = \varepsilon_{3t} - \hat{c}_{13} v_{1t} - \hat{c}_{23} v_{2t}, \dots \\
&\dots \\
&v_{kt} = \varepsilon_{kt} - \hat{c}_{1k} v_{1t} - \hat{c}_{2k} v_{2t} - \dots - \hat{c}_{k-1,j} v_{k-1,k}
\end{aligned}
\qquad (4)
$$

Therefore, the first innovation, v_{1t}, is equal to ε_{1t}. The second innovation, v_{2t}, is the residual of the OLS regression of ε_{2t} on v_{1t}, and so on. By construction, the residuals of linear OLS regressions are uncorrelated with each of the explanatory variables, so the innovations v_{1t}, v_{2t}, ..., v_{kt} are uncorrelated (Novales, 2011).

The process introduces an ordering of variables, as it gives the transformed error terms a different relevance. This means that the first variable cannot respond to contemporaneous shocks (within the year) of any other variables, while the second variable can respond to contemporaneous shocks in the first variable but not in the subsequent variables, and so on.

Contemporaneous restrictions on the responses of the variables listed in Table 4 are imposed, for which Cholesky factorization is used. The main trading partners' growth rates and the terms of trade are ordered in the first place, respectively. Therefore, they cannot be contemporaneously affected by the subsequent variables, which make sense since Argentina is a price-accepting country of the products it sells to the rest of the world and does not represent more than 6% of the export basket of any of the countries considered.

These two variables are followed by GDP, Balance of Trade, External public debt, Capital outflow, and Real wage. Considering that the result of the trade balance is a part of GDP, it comes right after it in the ordering. Both the external debt and the Capital outflow variables are expected to depend on the country's economic performance and its trade surplus or deficit. The external debt preceded the capital outflow in the ordering following the idea that a large proportion of the debt incurred made it possible for those capitals to leave. Real wage is placed at the end, as it is one of the variables that adjust most quickly[15], so it can respond contemporaneously to any variable. In any case, it is corroborated that none of the main results discussed below vary significantly from changes in the order of the variables (see Table 12 in the Appendix).

Standard practice in VAR analysis is to report the results of Granger-causality tests, impulse responses, and variance decomposition. From the reduced form VAR, Granger causality contrast examines whether past values of a given variable help predict the behavior of another variable. From the recursive VAR, accumulated impulse response functions (AIRF) and variance decomposition are obtained. AIRF measures the sum of each variable's reaction to innovation in one variable across time. They are represented in several graphs, each of which includes the accumulated responses over time of a given variable to an impulse in each of the innovations. In turn, the decomposition of the variance allows us to divide the variance of the prediction error of each variable into the components that are attributable to the different shocks that the system may experience (Novales, 2011).

5. RESULTS

5.1. Full sample: 1930-2018

Based on the Akaike information criterion, a three-lag VAR is performed, which is the least possible amount of lags that eliminates residual autocorrelation[16]. The system does

[15] This is particularly important for a country with an inflationary tradition like Argentina. It is true that the nominal wage crosses institutional barriers that slow down its reaction, but the inflation component makes it respond more quickly.

[16] The autocorrelation LM test, performed to check for serial correlation in the residuals up to the third lag, has a p-value of 0,0985 that indicates no serial correlation at 5% significance level. Also, the Jarque-Bera residual normality test is performed, but a p-value=0,000 indicates that jointly the residuals in the VAR system are not normally distributed. Nevertheless, the non-normality of the residuals, while not desirable, does not represent problems for the consistency of the estimators and allows for inference in an asymptotic sense. White heteroscedasticity LM test is also performed, and with a p-value=0,0888 the null hypothesis of homoscedasticity is not rejected (Wooldridge, 2009).

not have unit roots in the characteristic polynomial, so it satisfies the stability condition. This implies that when a dependent variable experiences a shock it returns to equilibrium over time.

Table 2 presents the results of the Granger-Causality tests. It shows the p-values associated with the F-statistics for testing whether the relevant sets of coefficients are zero, i.e. that lags of the variable in the row labeled "Regressor" do not enter the reduced form equation for the column variable labeled "Dependent Variable". In bold are indicated p-values that allow rejecting the null hypothesis of the regressor not causing, in Granger's sense, the dependent variable.

At first glance, it can be seen that both the terms of trade and the growth of main trading partners helps to predict the real wage at the 5 percent significance level. Trade Balance helps to predict GDP, and both GDP and Trade Balance help predict the External Public Debt level. Real Wage, GDP, and External Public Debt level help predict Capital Outflow.

Table 5: Granger-causality tests

Regressor	Dependent variable in regression						
	c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_ko	c_realwage
c_tradepartn	x	**0,004**	0,328	0,345	0,910	0,661	**0,032**
c_tot	0,544	x	0,347	0,175	0,685	0,607	**0,006**
c_arggdp	0,296	0,764	x	0,135	**0,002**	**0,013**	0,877
c_tb	0,231	0,271	**0,002**	x	**0,001**	0,206	0,546
c_fordebt	0,887	0,972	0,477	0,626	x	**0,009**	0,393
c_ko	0,132	0,831	0,133	0,378	0,914	x	0,456
c_realwage	0,666	0,602	0,845	0,643	0,737	**0,027**	x
All	0,594	**0,042**	**0,004**	0,275	**0,000**	**0,001**	0,056

A subset of key impulse responses is reported in the text and the complete set of AIRF are reported in Figure 36 in the Appendix. The shock of each variable is set as one standard deviation of that variable and the accumulated responses are traced through ten periods. The red dotted lines represent confidence bands obtained from Montecarlo simulations.

Figure 9 and Figure 10 present output responses to shocks in trade partner's growth and the terms of trade, respectively[17]. As it is expected, both responses are positive, although 10 years after the TOT shock the cumulative GDP response is almost 50%

[17] By way of example: a standard deviation in the case of the trade partner growth series is 1,41 percent, which is equivalent to the movement of the variable in the year 1968; in the case of the TOT, the shock is equivalent to 12,70 basis points, which is approximately the positive variation recorded in 1960.

higher than the cumulative response to the other shock (first two columns of Table 6). This result is consistent with the fact that TOT influence both exports and imports, while the growth of other economies is only a determinant of exports. Nevertheless, GDP reaction to TOT is slower. It is only between the third and fourth post-shock period that the accumulated effects are equalized.

Among the effects that Charnakovi and Dolado (2014) point out that TOT can have on economic performance, there is evidence in favor of the "spending effect" and/or of the “commodity currency effect”. It happens that either its increase pushes the aggregate demand through increases in consumption, investment and public spending, and/or its increase causes the fall of the real exchange rate (appreciation), increasing the competitiveness of the economy and its final product.

Unlike what Lanteri (2009) finds for the long term, there does not seem to be an "external balance effect" in the short term: as it can be seen in the second column of Table 6, BoT reaction to TOT shock is negative, although TOT movements explain 7,5 percent of the variance in the BoT (see Table 6 and Figure 36 in Appendix). In the case of external debt, the reaction to TOT shock changes direction intermittently, although the accumulated effect from the fourth to the tenth period is only positive during two of those years (see Figure 36 in the Appendix) and the accumulated response after ten years is negative.

According to the description of the "external balance effect" by Charnakovi and Dolado (2014), the mechanisms that would not be operating for the effect to occur would be related to a marginal propensity to consume higher than the unit, which would absorb a significant part of the increase and prevent savings from growing and its subsequent effect on investment. It could also be the case that the impediments are in that last part of this mechanism and that are related to problems in the economy to save, or it may simply be the case that the period considered is not sufficient for it to occur. In any case, Lanteri (2009) argues that recent work has shown that the "external balance effect" depends on the permanence of the shock.

Figure 9: The response of GDP to a shock in the Main trading partners growth

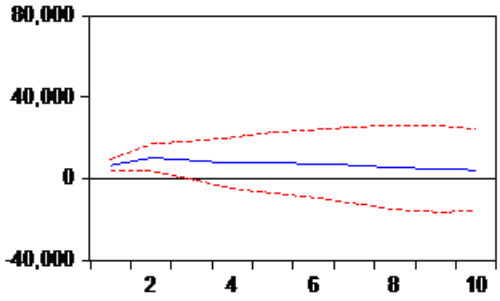


Figure 10: The response of GDP to a shock in the Terms of Trade

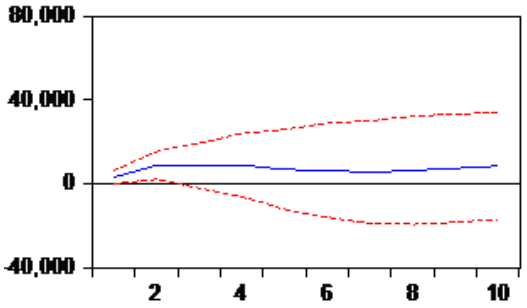


Figure 11: The response of Real Wage to a shock in the Main trading partners growth

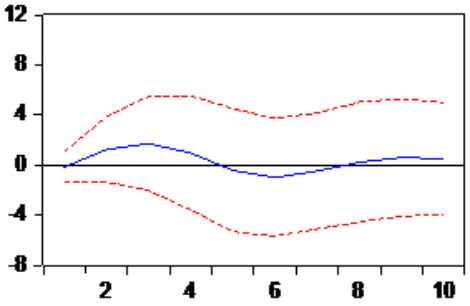
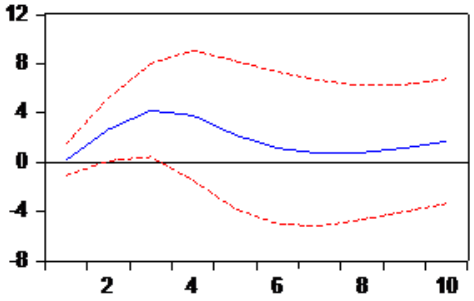


Figure 12: The response of Real Wage to a shock in the Terms of Trade



Such external shocks also have a positive impact on real wages. Figure 11 and Figure 12 represent the Real wage response to the growth of the main trading partners and TOT, respectively. Moreover, both variables cause real wages in Granger's sense, and the positive response to these impulses indicates that shocks coming from abroad allow for the external constraint to relax and improve living standards. Nevertheless, only the reaction of real wages to TOT shocks is positive throughout the entire analysis period. In Table 7 it is noticeable that at the 10-year horizon, 16,27% of the Real Wage variance is explained by the Terms of trade, while 7,41% is explained by the Trade Partners growth.

Both Real wage and GDP responses would be consistent with the fact that the main channel of real external vulnerability affecting Argentina is the TOT, since its main problem is the low diversity and complexity of its exports (and therefore its dependence on TOT) and not so much its export concentration in a few destinations (Abeles and Valdecantos, 2016). These results are also consistent with a low-income elasticity of exports –typically from economies specializing in low-value-added products (Zack & Dalle; 2016)- in relation to exports price elasticity.

Moreover, if we compare the elasticity of GDP and real wages with respect to shocks in the growth of trading partners- 1,18% and 0,72% respectively[18]- we find that, in the short run, there is some endogenous relationship between domestic variables that prevent the impulse given to Argentina's economic growth from being entirely transferred to the real wage.

Table 6: Accumulated impulse responses after ten years

	Variable that suffers the shock						
	c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_ko	c_realwage
c_tradepartn	0,008	-0,001	0,001	-0,004	0,001	0,000	0,000
c_tot	0,046	13,586	-1,527	6,704	-2,621	-2,956	0,922
c_arggdp	4.279,26	8.607,42	17.708,02	26.801,57	-2.362,36	-9.650,15	4.421,66
c_tb	-813,56	-797,15	-1.571,15	630,08	208,56	717,13	196,83
c_fordebt	1.233,80	-1.007,04	-0,823	-10.195,41	5.984,70	1.610,96	-1.074,35
c_ko	1.037,87	-272,39	2.001,44	959,58	2.183,94	2.684,41	413,56
c_realwage	0,522	1,701	5,098	3,766	-2,216	-0,231	5,844

Figure 13 illustrates that real wages shocks positively impact GDP after ten years, although the effect is vague (as can be seen in Figure 13, the effect becomes positive eight years after the shock). Nevertheless, there is a compelling positive and persistent effect of GDP on real wages.

Figure 13:The response of GDP to a shock in the Real Wage

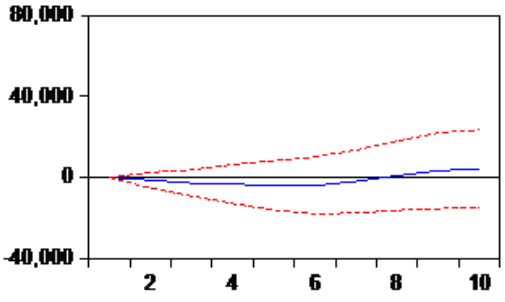
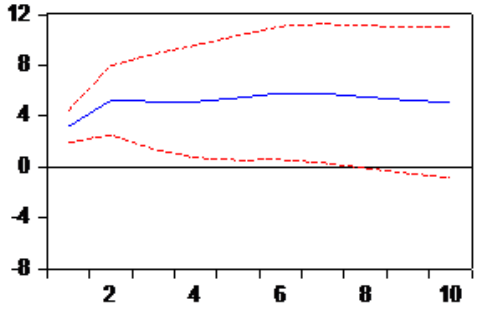


Figure 14: The response of Real Wage to a shock in GDP



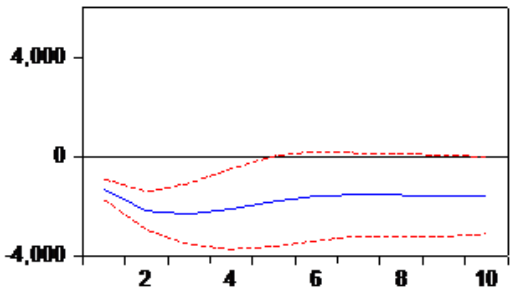
So far, it has been shown that the growth of trade partners and the increase in the terms of trade have a net positive effect on the Argentinian economy. However, the BoT shows the external bottleneck that occurs when the economy grows: as can be seen in

[18] GDP sensibility measures are calculated as the ratio between GDP accumulated response to a shock in c_tradepartn after ten years as a percentage of GDP average level (363.489.756.437 USD). Accumulated responses after ten years can be seen in Table 6. The other percentages for the full sample are calculated in a similar way.

Figure 15, when Argentina begins to grow, it automatically activates the mechanisms that block its future growth possibilities by increasing imports faster than exports.

BoT reaction is also consistent with Chena's proposal: when GDP increases in countries with high poverty levels that sell food to the rest of the world, part of the supply is consumed internally, which makes exports fall (or grow beneath its possibilities). Also, it is noted that almost 20% of the Trade Balance variance is explained by GDP at the 10-year time horizon, indicating the persistence of the aforementioned mechanisms (Table 7).

Figure 15: The response of the Balance of Trade to a shock in GDP



Regarding the variables that proxy external financial vulnerability, reaction to external debt shocks is analyzed. In a virtuous scheme, a country would take on external debt to expand its productive capacity, with which at least one or two years after the shock of the increase in debt, a boost in economic activity would be expected. Figure 16 indicates that far from contributing to growth in the short term, the external public debt does the opposite: ten years after a 7.849 million USD increase in public external debt output drops 23.362,36 million USD. This is consistent with external debt not necessarily constituting a form of financing investment or working capital, at least until the 10th period after the shock. Moreover, External Debt explains a low proportion of GDP variance -2,81% after ten years- (Table 7).

Table 7: Variance Decomposition from the Recursive VAR after ten years

	c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_ko	c_realwage
c_tradepartn	75,06	11,32	8,88	5,78	2,10	2,70	7,41
c_tot	4,10	69,40	6,85	7,51	1,28	0,61	16,27
c_arggdp	5,39	5,56	42,28	27,66	6,49	12,03	18,53
c_tb	3,74	6,93	29,84	52,37	39,83	25,45	3,36
c_fordebt	3,63	3,15	2,57	1,85	41,64	14,49	5,82
c_ko	6,30	2,02	6,35	1,95	3,22	37,95	1,30
c_realwage	1,78	1,62	3,24	2,87	5,45	6,76	47,31
	100	100	100	100	100	100	100

In the case of increased capital flight, the response in GDP fall is even more pronounced and persistent over time, as the de-capitalization of an economy blocks its future growth possibilities (Figure 17). 10 years after an increase in the stock of capital outflow equivalent to 4.266 million USD, the effect on GDP is a drop equivalent to 2,73 percent of the average GDP value. As Taylor (2018) highlights, lower capital accumulation corresponds to low saving rates, which increases the proportion of low-quality investment, the misallocation of it, and input price distortions (investment variety).

Figure 16: The response of GDP to a shock in the External Public Debt

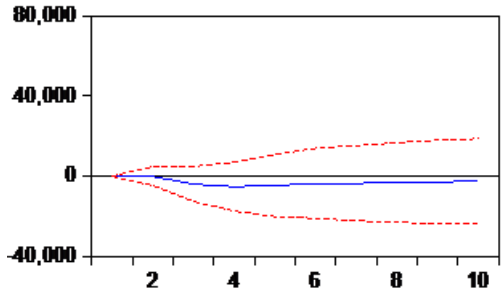


Figure 17: The response of GDP to a shock in the Capital Outflow

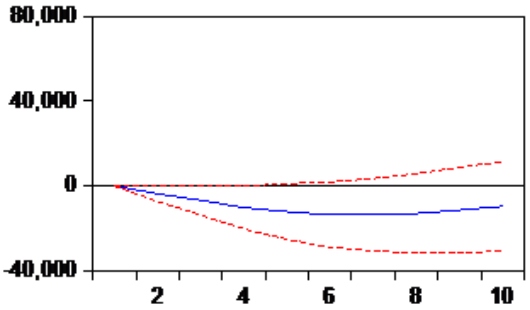


Figure 18 and Figure 19 show the Real Wage reaction to shocks in the External Public Debt and the Capital Outflow, respectively. Like in the GDP response, in Figure 18 it can be seen that Real wage reacts negatively to shocks in the External public debt, accumulating a fall of 2,21 basis points ten years after the shock. Comparing the elasticity of output and real wages with respect to external debt, there is a greater sensitivity of the real wage to increases in debt: in the case of the former, the elasticity is equivalent to -17,35 percent, while in the latter it is equivalent to -13,98%. In the case of the reaction to the capital outflow, although wages are less sensitive to it than to the external debt, the net effect is a drop equivalent to 0,231 basis points (Table 6).

Figure 18: The response of Real Wage to a shock in the External Public Debt

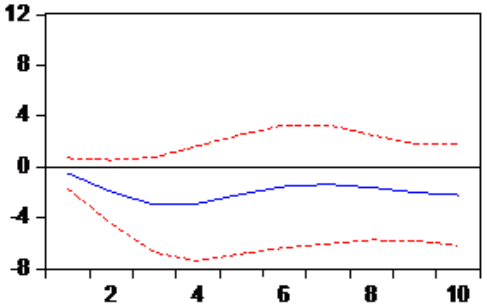


Figure 19: The response of Real Wage to a shock in the Capital Outflow

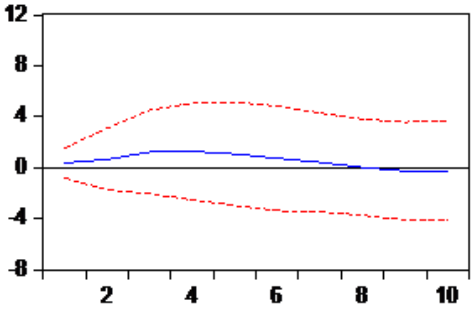
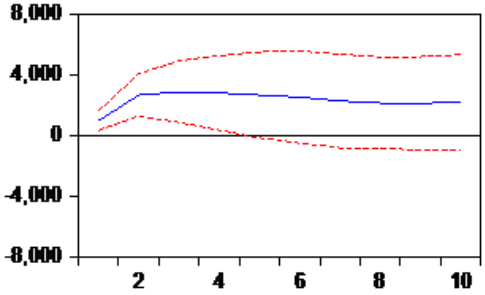


Figure 20 shows the negative dynamics between the increase in external debt and capital outflow and its persistent effect over time: faced with a shock in debt, the capital

outflow increases. This constitutes evidence in favor of the phenomena that Basualdo (2013) describes which consists of external debt making capital flight possible in a context of a structural shortage of foreign currency, by providing it.

Figure 20: The response of the Capital Outflow to External Public Debt



In summary, it can be seen that the growth of trading partners and improvements in the terms of trade positively affect output and real wages. Moreover, comparing both effects, it is confirmed that the Argentinian economy is relatively more sensitive to variations in the TOT. In the short term, the positive effects of TOT are channeled whether through an increase in aggregate demand and/or through real exchange rate variations. Also, there is evidence of the Trade balance bottleneck, which imposes structural constraints on growth.

In the area of external financial vulnerability, not only it is confirmed that in the short term external debt does not promote growth, but that it produces the opposite. It also manifests negative effects on real wages. Capital flight also has a sustained negative impact on growth. Furthermore, there is evidence in favor of the capital flight vicious cycle, since it consumes borrowed dollars that the country needs, which contributes to the de-capitalization of the economy.

5.2. Period's comparison: 1930-1975 & 1977-2018

From the aforementioned change in the accumulation model that took place in Argentina in the 1970s, the question arises as to whether this affected the country's external vulnerability. In order to compare the short-run impact of external shocks on the Argentinian economy in the periods 1930-1976 and 1977-2018, a VAR is made for each of them. The results indicate substantial changes in the impact of shocks, which increase the country's external vulnerability.

Since it is not possible to replicate the same VAR as the original for the sample sizes that result from period division, some modifications are applied[19]. A recursive VAR(1) is configured for six variables:

$$Y_t = [c\_tradepartn; c\_tot; c\_arggdp; c\_tb; c\_fordebt; c\_realwage]$$

The order of the variables is the one shown in the Y_t vector, following the same criteria for the whole sample. LM-tests indicate that there is no autocorrelation in the residuals[20]. Also, the systems do not have unit roots in the characteristic polynomial, so it satisfies the stability condition.

Table 8: Granger Causality test. Comparison between periods

Regressor		Dependent variable in regression					
		c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_realwage
c_tradepartn	1930-1976	x	**0,000**	0,054	0,206	0,998	**0,046**
	1977-2018	x	0,463	0,789	0,165	0,455	0,616
c_tot	1930-1976	0,132	x	0,526	0,882	0,955	**0,007**
	1977-2018	0,342	x	**0,099**	**0,014**	0,685	0,616
c_arggdp	1930-1976	0,056	**0,030**	x	0,058	0,795	0,050
	1977-2018	0,294	0,232	x	0,912	0,092	0,268
c_tb	1930-1976	0,145	0,293	0,143	x	0,215	**0,000**
	1977-2018	0,786	**0,005**	0,214	x	0,175	0,469
c_fordebt	1930-1976	0,292	0,789	**0,012**	0,587	x	0,536
	1977-2018	0,676	0,974	0,271	0,520	x	0,623
c_realwage	1930-1976	0,077	0,285	0,119	0,100	0,207	x
	1977-2018	0,748	**0,029**	0,219	0,373	0,558	x

In Figure 21 and Figure 22Figure 22, it can be seen that GDP response to shocks in the main trading partners' growth becomes stronger in the second sub-period, indicating higher real external vulnerability. Not only the cumulative response is greater in the second period (Table 9), but also partner's growth explains more of the variability of GDP in the second sub-sample (third row in Table 10). The GDP elasticity with respect to main partners' growth goes from 0,03 percent to 0,13 percent in the period 1977-

[19] If for the new sample sizes the same VAR as in the previous section would be applied -7 variables and 3 lags-, there would be unit roots in the characteristic polynomial. The stability condition for a VAR of those seven variables is only met by establishing a VAR (1), which has correlation in the residuals. Therefore, it is chosen to drop the variable Capital Outflow, since it is the one that later begins to have notable movements (from the 90's)

[20] Autocorrelation LM test is performed for each VAR: for the 1930-1976 VAR, p-value of LM-Statistic is 0,373, not allowing rejecting the null hypothesis of no serial correlation. For the 1977-2018 VAR, p-value is 0,433.

2018[21]. In addition, there is evidence of a greater persistence of the effect in the second sub-period.

Figure 21: First sub-sample. GDP response to a shock in the main trading partners growth

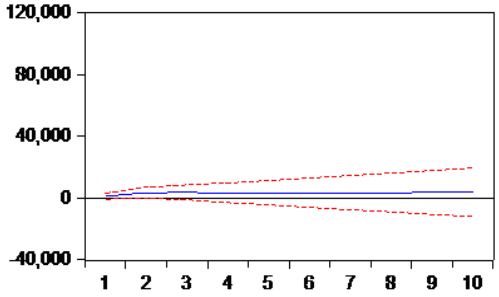


Figure 22: Second sub-sample. GDP response to a shock in the main trading partners growth

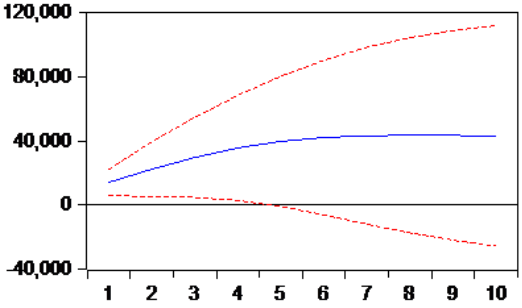


Figure 23: First sub-sample. GDP response to a shock in TOT

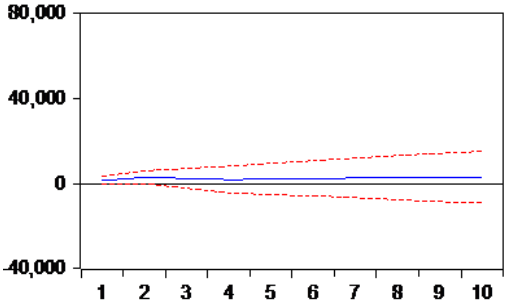
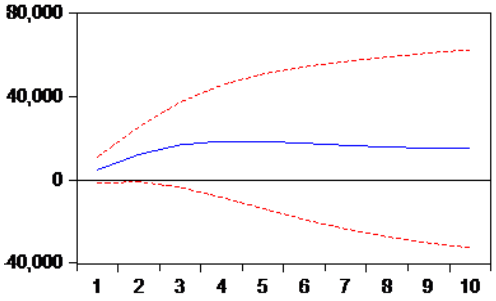


Figure 24: Second sub-sample. GDP response to a shock in TOT



In the case of GDP response to shocks in the Terms of trade (Figure 23 and Figure 24), the increased sensitivity is even greater. Not only the response in the short term is larger but also the positive reaction in the following periods along with its persistence after 10 years. The GDP elasticity with respect to TOT goes from a 14,28 percent to a 38,19 percent in the period 1977-2018.

These results are indicative of the end of the ISI stage and the beginning of an era of greater trade openness, with the corresponding increase in real external vulnerability that this naturally implies. As Ocampo (2016) explains, during the ISI stage, the major macroeconomic policy instruments were focused on managing external shocks, especially those coming from the current account. During the trade and financial liberalization stage, many instruments were abandoned, except for the exchange rate,

[21] Both sensibility measures are calculated as the ratio between GDP accumulated response to a shock in Trade Partner's growth after ten years weighted by GDP average in that period multiplied by the trade partner's standard deviation also weighted by its average. Descriptive statistics of the variables used can be found in Table 11 in the Appendix. Accumulated responses after ten years can be seen in Table 9. The other percentages are calculated in a similar way.

which became increasingly flexible to accommodate external shocks coming through the capital account.

In relation to the shocks in the TOT, it is also noteworthy the disappearance of the "external balance effect" from one period to another. As can be seen in Table 8, between 1930 and 1976, the increase in the TOT produced a sharp fall in the foreign debt, while it would negatively affect the Trade Balance. Between 1977 and 2018, the "external balance effect" disappears: TOT shocks increase the level of external debt and impacts more negatively than before on the outcome of the trade balance (see Figure 37 and Figure 38 of the Appendix, and Table 9). Moreover, in the second sub-period TOT causes Trade balance in Granger's sense.

Table 9: Accumulated impulse responses after ten years. 1930-1976 & 1977-2018

	c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_realwage
Response of Trade Partners to a shock in						
First sub-sample	0,014	-0,007	-0,007	-0,008	0,013	0,004
Second sub-sample	0,007	0,000	-0,004	-0,003	0,003	0,003
Response of TOT to a shock in						
First sub-sample	14,405	20,948	4,025	0,947	-0,867	-0,374
Second sub-sample	4,650	8,249	-0,783	6,539	-0,514	4,149
Response of GDP to a shock in						
First sub-sample	3.715,20	2.983,66	9.580,61	5.270,03	-7.981,78	-250,55
Second sub-sample	43.155,77	14.934,00	29.242,52	34.632,97	-12.788,46	-8.582,71
Response of Trade Balance to a shock in						
First sub-sample	-119,41	-10,53	-237,82	177,28	66,48	-60,98
Second sub-sample	-2.770,11	-2487,81	-3.770,43	891,95	1.480,27	356,97
Response of External Debt to a shock in:						
First sub-sample	-58,77	-175,24	-392,07	-647,99	972,90	-115,34
Second sub-sample	-7474,10	641,39	-4734,41	-14316,24	18535,71	2833,78
Response of Real Wage to a shock in:						
First sub-sample	4,175	3,955	4,820	5,314	-3,633	3,846
Second sub-sample	6,196	4,533	6,163	5,758	-4,641	9,881

Furthermore, the response of real wages to shocks in the growth of trading partners and TOT also constitutes evidence of increased real external vulnerability in the second sub-period. The elasticity of real wages with respect to the growth of trade partners goes from 6,19 percent in the period 1930-1976 to 7,97 percent in the following period. In the case of the reaction to TOT shocks, as can be seen in the last row of In relation to the shocks in the TOT, it is also noteworthy the disappearance of the "external balance effect" from one period to another. As can be seen in Table 8, between 1930 and 1976, the increase in the TOT produced a sharp fall in the foreign debt, while it would negatively affect the Trade Balance. Between 1977 and 2018, the "external balance effect" disappears: TOT shocks increase the level of external debt and impacts more

negatively than before on the outcome of the trade balance (see Figure 37 and Figure 38 of the Appendix, and Table 9). Moreover, in the second sub-period TOT causes Trade balance in Granger's sense.

Table 9, Real wage becomes more sensitive to changes in TOT. Nevertheless, they explain a lower proportion of wages variance after ten years.

Figure 25: First sub-sample. Real wage response to a shock in the Main trading partners 'growth

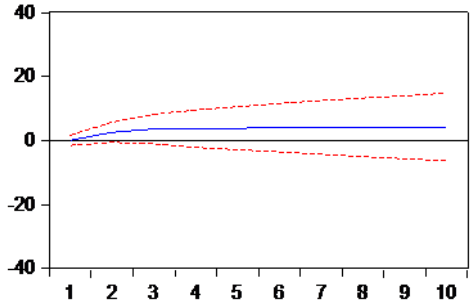


Figure 26: Second sub-sample. Real wage response to a shock in the Main trading partners 'growth

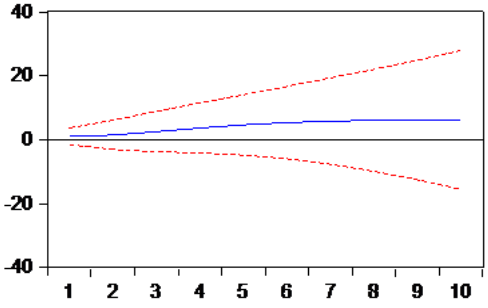


Figure 27: First sub-sample. Real wage response to a shock in TOT

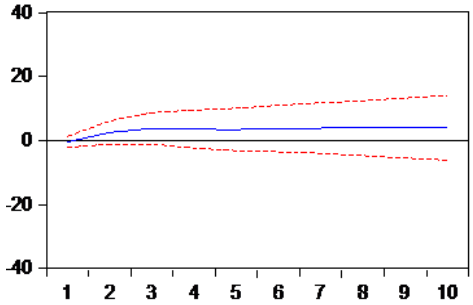
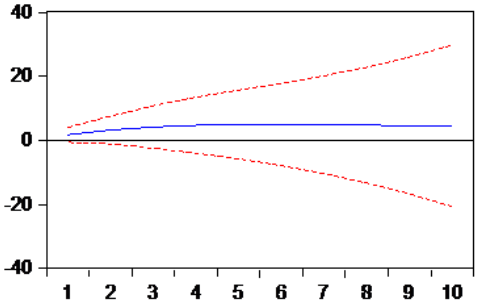


Figure 28: Second sub-sample. Real wage response to a shock in TOT



In Table 9 it can be seen that the bottleneck that occurs in the trade balance when the output grows persists in both periods. However, if the comparison is done with the elasticities of the Trade Balance with respect to GDP for both periods, it can be seen that the sensitivity of the former is lower in the second period. Nevertheless, as can be seen in Table 10, in this second period, the GDP explains a greater portion of the variability in the Trade Balance.

Another important change between the two sub-periods is found in the reaction to movements in the level of external public debt. Both GDP and Real wages maintain the negative relationship with the external debt that was observed with the full sample, but while the sensitivity of the GDP to changes in the debt does not suffer great variations between the two sub-periods, the negative reaction of the real wage to the debt shock is strongly intensified. Real wage elasticity with respect to external public debt goes from -17,35 percent to -31,82 percent. It seems that changes in financial matters in the 1970s

worsened the vicious circle in which taking on foreign debt has no correlation with improving living standards.

Figure 29: First sub-sample. GDP response to a shock in External Debt

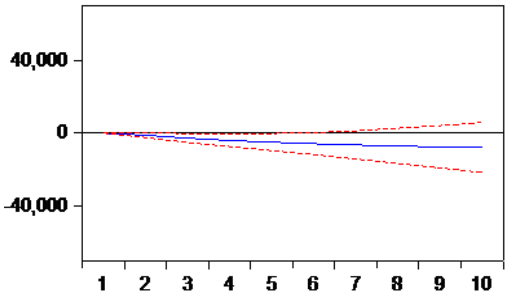


Figure 30: Second sub-sample. GDP response to a shock in External Debt

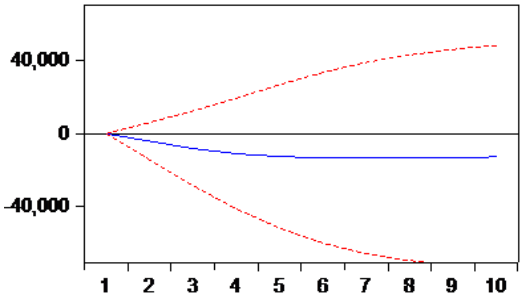


Figure 31: First sub-sample. Real wage response to a shock in External Debt

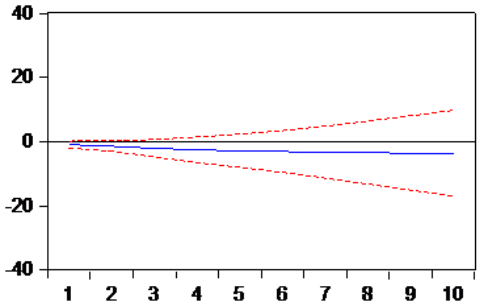


Figure 32: Second sub-sample. Real wage response to a shock in External Debt

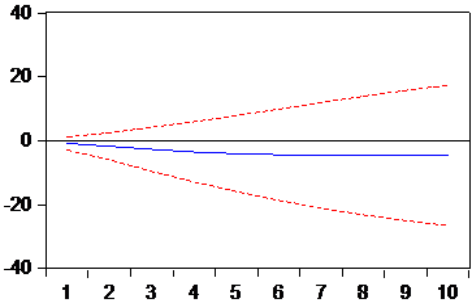


Table 10: Variance decomposition after ten years. 1930-1976 & 1977-2018

	c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_realwage
Percentage of the variance of c_tradepartn due to:						
First sub-sample	69,987	9,763	2,553	6,944	5,616	5,136
Second sub-sample	88,523	1,463	5,492	1,273	1,338	1,911
Percentage of the variance of c_tot due to:						
First sub-sample	28,977	64,848	2,578	2,068	0,187	1,342
Second sub-sample	6,413	67,405	0,177	16,504	0,158	9,343
Percentage of the variance of c_arggdp due to:						
First sub-sample	11,496	8,689	53,573	9,554	13,951	2,737
Second sub-sample	30,638	8,484	37,030	18,453	3,583	1,812
Percentage of the variance of c_tb due to:						
First sub-sample	10,837	4,501	16,026	65,423	0,446	2,767
Second sub-sample	11,421	12,618	31,610	40,893	2,428	1,030
Percentage of the variance of c_fordebt due to:						
First sub-sample	0,594	2,070	9,897	25,336	61,028	1,075
Second sub-sample	8,723	0,959	6,239	19,192	64,009	0,878
Percentage of the variance of c_realwage due to:						
First sub-sample	11,255	16,219	21,338	27,965	3,016	20,207
Second sub-sample	6,618	7,956	12,889	9,741	4,325	58,470

In summary, the comparison between periods highlights the increase in real external vulnerability in the period 1977-2018, that is, the greater intensity of the short-term impact that the growth of trade partners and the terms of trade generate on both product and real wages.

The disappearance of the "external balance effect" in the second period is also noteworthy, indicating that movements in the terms of trade lose power over both the trade balance and the level of external public debt. This, together with the fact that the shocks in the level of debt accentuate their negative effect on real wages in the second period, indicates that foreign debt is moving away from being a mechanism that serves to push the growth and development of the economy.

6. CONCLUSIONS

The Argentinian economy grows slowly and discontinuously: from 1930 to 2018, the country experienced 28 years of economic contraction, i.e. more than one recession every three years. In the attempt to understand the country's poor economic performance, Chambers' notion of vulnerability has been used in this work (1989), which implies that Argentina's vulnerability has an internal and an external side. The former refers to the defenselessness of the country's economy, while the latter alludes to exposition to external shocks.

The first objective of this thesis has been to describe the internal side of vulnerability, explained from the perspective of the balance-of-payments constraint. Several authors stress that the existence of an unbalanced productive structure leads the country to a recurrent shortage of foreign currency that limits growth possibilities, both in the long and in the short term. The unbalanced productive structure proposition implies that there are two productive sectors with a discrete gap of productivities. In the Argentinian case, this was born with the protectionist bias during the ISI stage (1930-1975). On the one hand, the country has a primary sector that works at international costs and is a foreign exchange provider. On the other hand, it has an industrial sector, which costs are higher than international ones and permanently demands foreign exchange to expand, since many productive inputs and capital goods are not produced locally due to the limited depth of the substitution process and the country's technologically adaptive behavior.

The balance-of-payments dominance worsens with the change in the accumulation model from the 1970s onwards, when the country incurred a process of indebtedness that involved allocating more and more foreign currency to debt repayment, adding to the pre-existing problem a new bottleneck in the capital account. Furthermore, this is aggravated by the strong capital outflow that began in the 1990s, a process that not only contributed to the de-capitalization of the country but also implied the absorption of a large part of the foreign currency that was entering the country via external debt.

Under a balance-of-payments dominance scheme, domestic economic cycles depend on external shocks, which constitute the other side of Argentina's economic vulnerability. Therefore, the second objective of this thesis has been describing the country's reaction to these shocks. For this purpose, autoregressive vectors have been used, as they provide a systematic way to capture rich dynamics in multiple time series, allowing to

describe the intricate relationship between cycles of Argentina's main trading partner's growth, the country terms of trade, the level of external public debt and capital outflow, and its impact on the trade balance, output, and real wages.

There are several interesting findings. Firstly, the interrelationship in the cyclical movements of the variables shows that the trade balance bottleneck is confirmed for the short-run, and it operates throughout the entire period although in the second sub-period (1977-2018) it relaxes slightly. This means that, given the country's trade specialization, when Argentina begins to grow, it automatically activates the mechanisms that block its future growth possibilities by increasing imports faster than exports.

Secondly, it is shown that GDP reacts positively to shocks in TOT and the trade partner's growth, and it is observed that it responds more intensively to the first of these two shocks. In addition, there is evidence of the positive effect that these shocks have on people's purchasing power and material well-being. It is possible that the TOT-Real wage relationship is mediated by the appreciation of the exchange rate, and by its use as an inflationary anchor. Concerning the channels through which TOT push economic growth, it should be noted that in the analysis of the entire sample, the direct relationship between the variables could be a sign in favor of the "spending effect" and the "commodity-currency effect", although there is evidence against the "external balance effect": the terms of trade increase does not improve the balance of the trade neither reduce the level of debt. However, by splitting the sample in two, evidence of the "external balance effect" is found for the first period, which then disappears between 1977 and 2018.

Thirdly, the real external vulnerability i.e., the one related to the country's commercial specialization, increases between periods which is consistent with the beginning of a stage of trade and financial liberalization and abandonment of protection measures against external shocks. This is especially notable in the greater sensitivity of output to TOT shocks in the second sub-period, which is also coherent with an increasingly concentrated export basket, reflecting the persistence of the unbalanced productive structure and its effects on Argentina's economic performance.

Fourthly, it is verified that the increase of the external public debt not only does not contribute to growth, but it does the opposite, at least in the short-term. The number of

sovereign debt crises that the country has had forces the assumption that in the long term it will not do so either. It should be noted that the effect of the foreign debt is even worse on the real wage. When comparing this effect between sub-periods, it can be seen that the results of external debt shocks do not change much for the GDP, although they do for the real wage. In other words, between 1977 and 2018, not only debt continues to be a recessive lever, but it corrodes the material possibilities of the population more and more.

Fifthly, it can be seen that in the short term external public debt is providing the necessary foreign currency to move capitals abroad. This, together with the fact of capital outflow negatively affecting output, seriously worsens the external front in a scheme of balance-of-payments dominance. At the same time, this result is related to the increased sensitivity of the real wage to financial shocks, since generally the processes of foreign debt financing capital flight end in crises and major depreciations that, through their inflationary effect, corrode the real wage.

Summarizing, the impacts of external shocks on GDP, trade balance, and real wages have been described and the hypotheses have been proven. Likewise, comparing results between periods, the increase in real and financial external vulnerability is confirmed: the former is verified both for GDP and real wage, and the latest for real wage. At the same time, these results are indicative of a change in the accumulation model between the two sub-periods compared, understood as the set of regularities that shape the process of capital accumulation.

Therefore, Argentina has the complex challenge of diversifying its export basket to break the bottleneck it still has in the trade balance and to protect itself from external shocks. Likewise, the country will have to build the participative social monitoring mechanisms that will allow it to correctly direct the funds it obtains from borrowing abroad towards growth and economic development.

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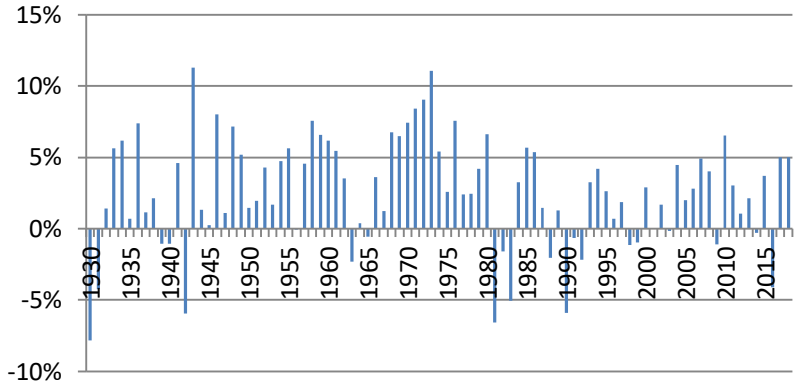
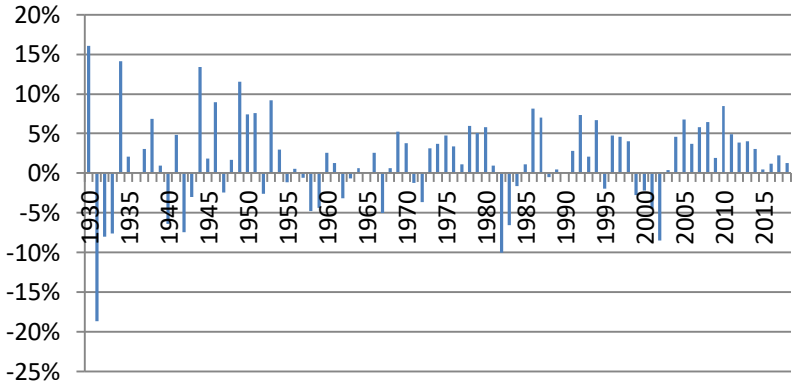
8. APPENDIX

Figure 33: GDP growth rates - Selected South American economies (1930-2018)

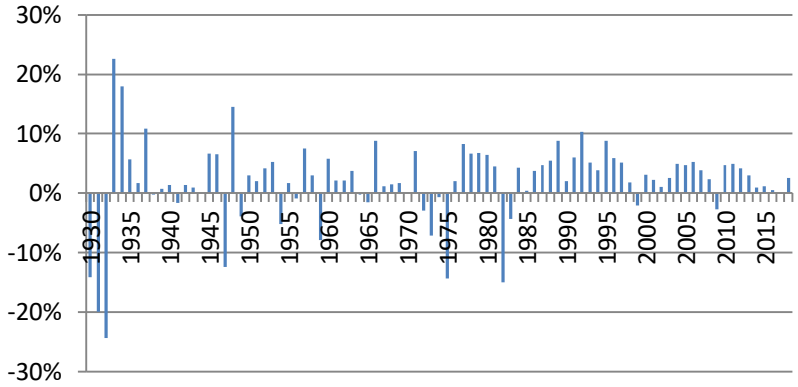
Panel A: Brazil



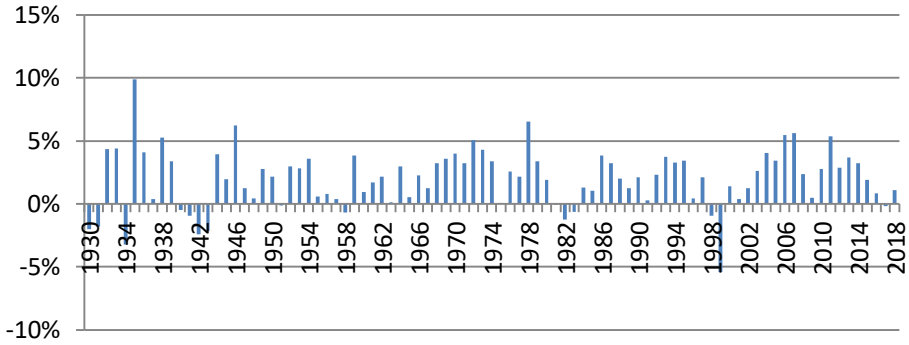
Panel B: Uruguay



Panel C: Chile



Panel D: Colombia



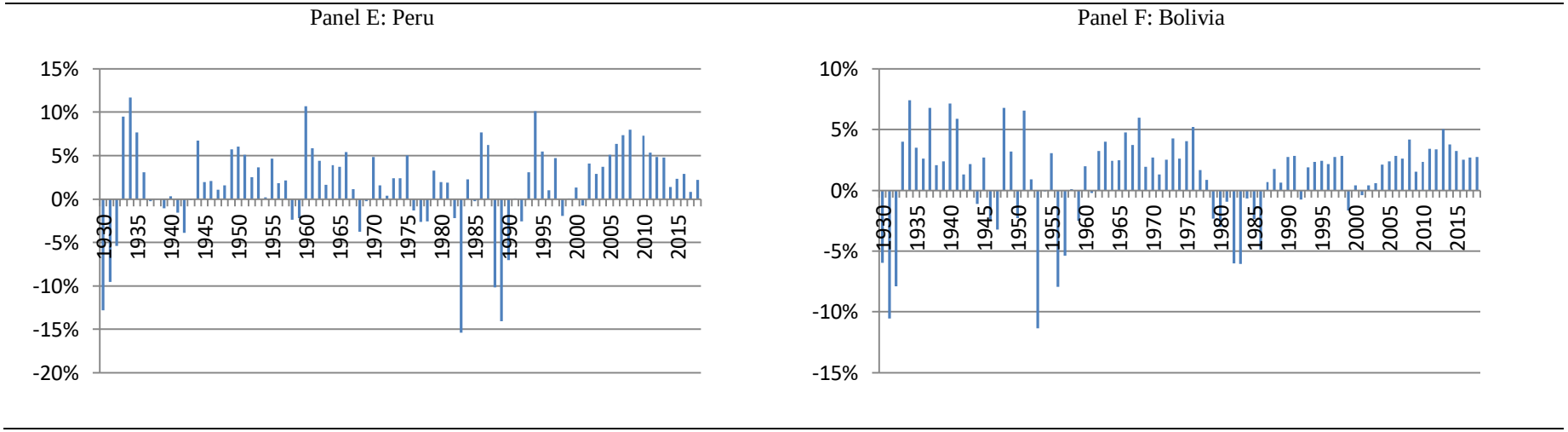


Figure 34: Proportion of total value exported in each year represented in the variable Trade Partners

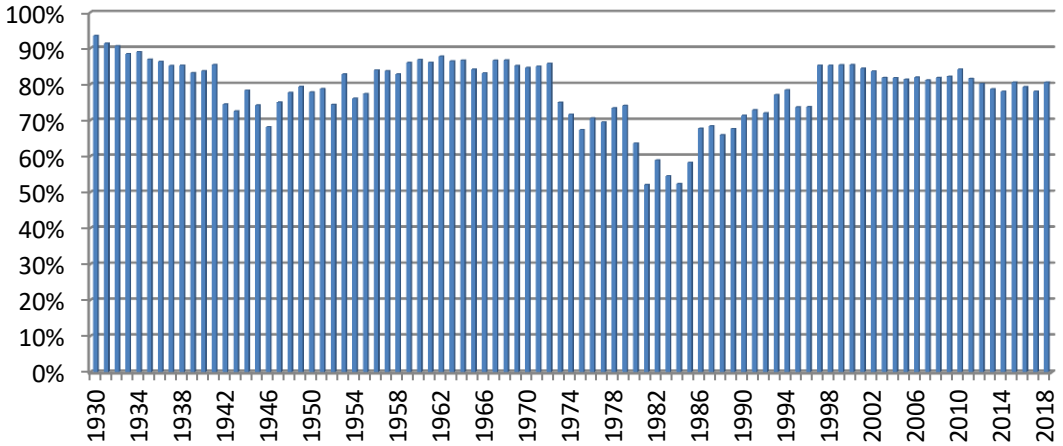
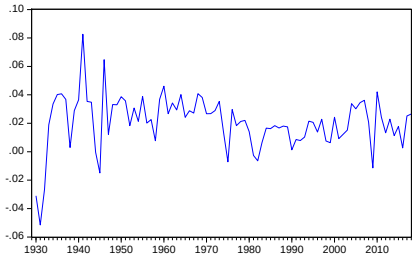


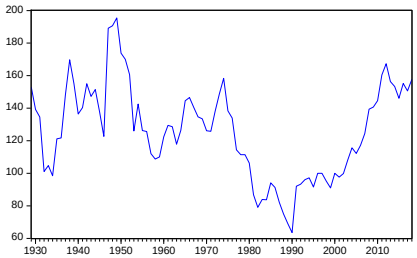
Figure 35: Variables included in VAR

Original series

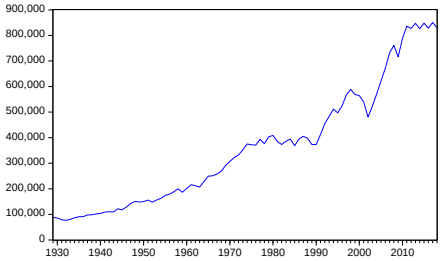
Trade Partners



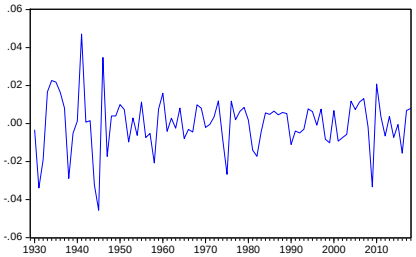
Terms of Trade

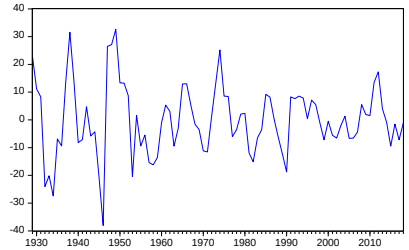


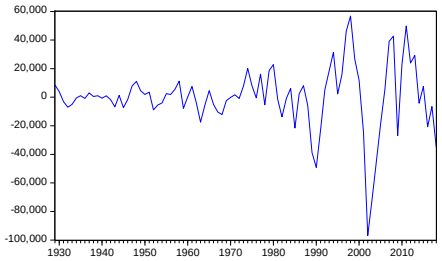
Argentina GDP



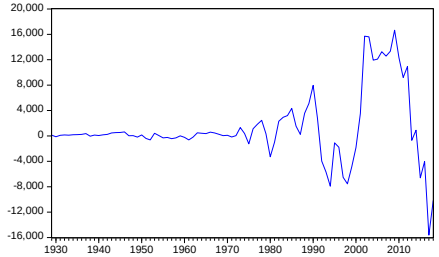
Cycle

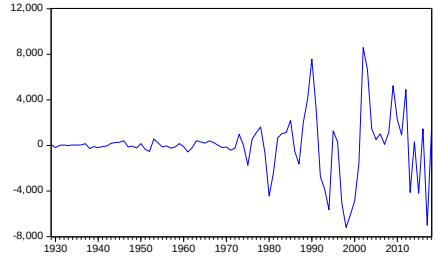




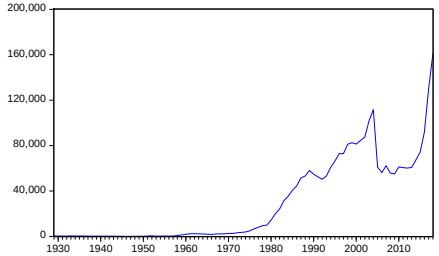


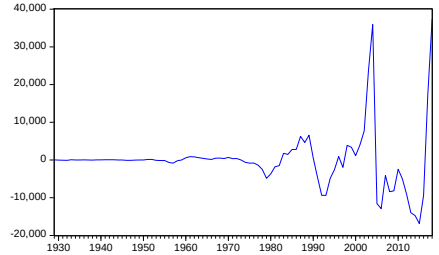
Trade Balance



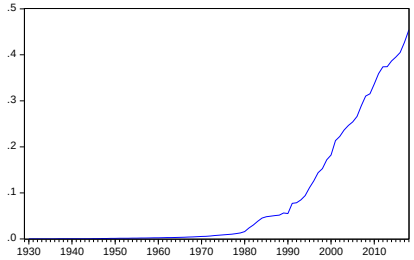


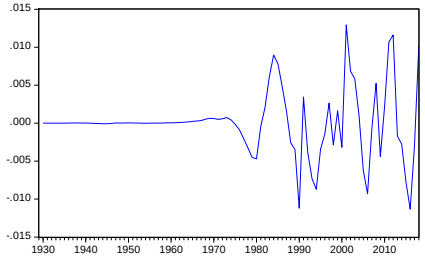
Public External Debt



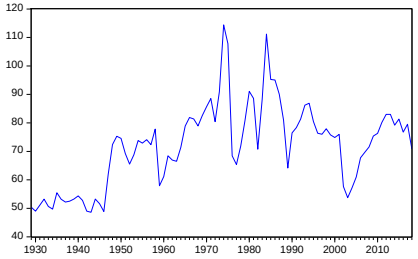


Capital Outflow





Real Wage



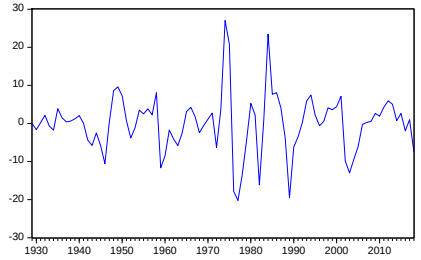


Table 11: Descriptive statistics

		c_tradepartn	c_tot	c_arggdp	c_tb	c_fordebt	c_ko	c_realwage
Mean value (original series)	1930-2018	2,088	125,454	363.489,756	1.231,584	29.541,099	5.163	72,297
	1930-1976	0,025	138,506	183958,312	115,763	1225,297	206	67,448
	1977-2018	0,016	110,847	564393,992	2480,240	61244,019	10.592	77,724
Standard deviation (cycles)	1930-2018	1,414	12,530	22.395,21	2.614,119	7.848,997	4.266,315	7,694
	1930-1976	1,716	15,727	6.651,062	389,352	380,242	257,893	1,716
	1977-2018	0,994	7,680	32.044,442	3.807,476	11.491,691	6.242,642	0,994

Table 12: VARs with different ordering of variables and fulfillment of hypotheses

Order of variables in each VAR	Hypothesis									
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10
1.c_tot **2.**c_tradepartn **3.**c_realwage **4.**c_arggdp **5.**c_tb **6.**c_fordebt **7.**c_ko	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.c_tradepartn **2.**c_tot **3.**c_arggdp **4.**c_tb **5.**c_fordebt **6.**c_ko **7.**c_realwage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.c_tot **2.**c_tradepartn **3.**c_tb **4.**c_arggdp **5.**c_fordebt **6.**c_ko **7.**c_realwage	✓	X	✓	✓	✓	X*	✓	✓	✓	✓
1.c_tot **2.**c_tradepartn **3.**c_tb **4.**c_arggdp **5.** c_realwage **6.** c_fordebt **7.** c_ko	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

H1) Positive shocks in terms of trade positively impact Argentina's GDP
H2) Positive shocks in the main trading partners growth positively impact Argentina's GDP
H3) Positive shocks in the main trading partners growth positively impact real wage
H4) Positive shocks in the terms of trade positively impact the real wage
H5) Positive shocks in Argentina's GDP affects negatively the Balance of Trade
H6) Positive shocks in the level of external debt affect negatively Argentina's GDP
H7) Positive shocks in the capital outflow affect negatively Argentina's GDP
H8) Positive shocks in the level of external debt affect negatively Argentina's real wage
H9) Positive shocks in the capital outflow affect negatively Argentina's real wage
H10) Positive shocks in the level of external debt positively impact capital outflow

** In this case the cumulative response of GDP to the increase in debt is negative during the five years following the shock, and 10 years after the shock output increases in 506 million USD, which is a small increase in relation to the size of the falls that can be seen in the rest of the tests.*

Figure 36: Accumulated responses: whole sample 1930-2018

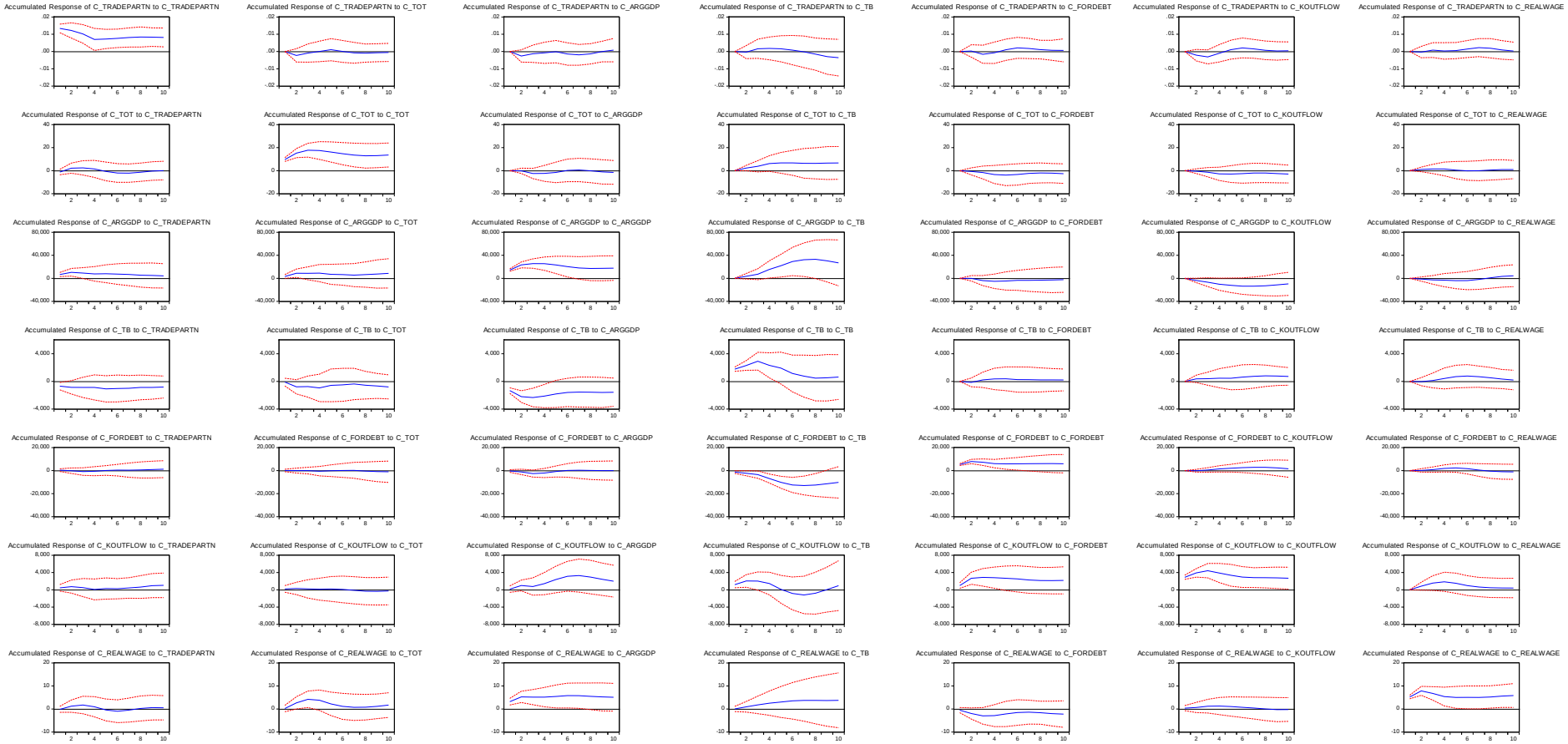


Figure 37: Accumulated responses - First sub-sample (1930-1976)

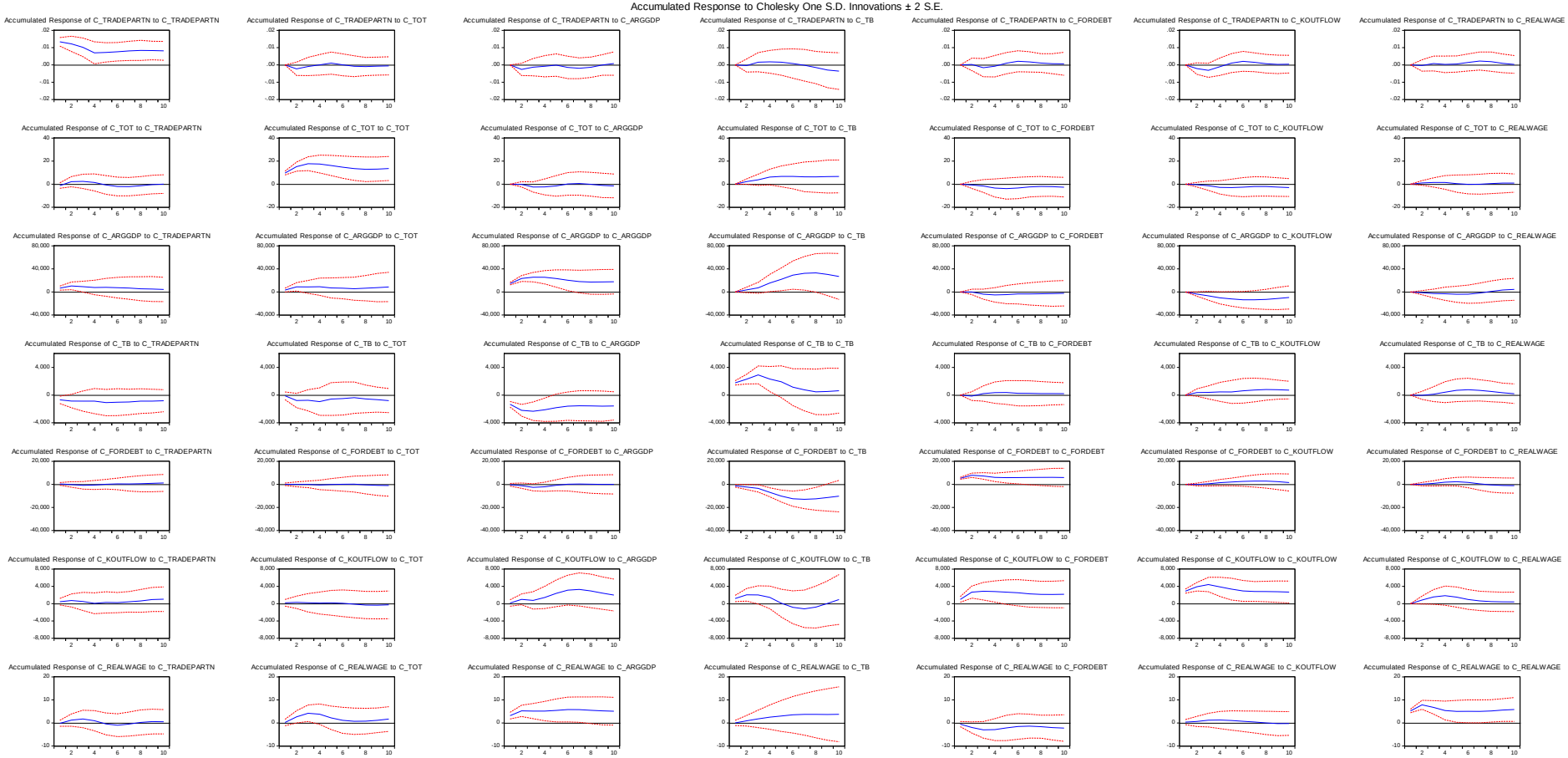


Figure 38: Accumulated responses-Second sub-sample (1977-2018)