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GERMAN EXPORTS, ECONOMIC GROWTH AND FOREIGN DEMAND: AN ANALYSIS OF THE PERIOD 2000–2017

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ABSTRACT

Taken as a model of economic success expressed as a position of leadership achieved in an environment of economic integration, Germany has shown a growth based to a large extent on its exports. In this sense, this study aims to identify to what extent – and if – the exports of goods from Germany are conditioned by foreign demand between 2000 and 2017. According to the applied methodology, using an Autoregressive Distributed Lag (ARDL) model and the bounds test for cointegration, the estimated coefficients indicate, for both short and long run, an elastic behavior of German exports relative to the external demand changes. Additionally, in the same period, the results corroborated the positive hypothesis of a long-term relationship between the variables. However, although the statistics and historical analysis point to the weakness of a growth model that relies heavily on exports as a fundamental source of demand, the discussion raised forces reflection on the institutional characteristics that may actually contribute to a better understanding of the aspects that define the evolution of recent German economic history.

Contribution/Originality: This study contributes to the existing literature by identifying to what extent – and if – the exports of goods from Germany are conditioned by foreign demand between 2000 and 2017.

1. INTRODUCTION

Between 2000 and 2017, Germany's income grew by an average of 1.31% per year (p.a.) in real terms, and the country's total exports grew at an average rate of 4.47% per year, 3.26 times income growth. In the same period, at current values and for comparative purposes, the country's GDP grew on average 0.91% per quarter (p.q.), while its exports grew at approximately 1.6 times the rate (1.43% p.q.). Compared to some European economies, for example, German exports grew at a speed 1.55 and 2.15 times above the average growth of the English and Italian economies. Yet, between 2000 and 2017, Germany accounted for more than one-quarter (27.2%) of the Eurozone's GDP and, respectively, 19.6% and 10.5% of the income of the European Union and the countries that make up the G7. In the same period, the ratio between total exports and output in Germany advanced by 53.3% (16.4 percentage points (pp)) and thus, despite the 41.4% growth in the ratio between total imports and income, the positive balance of the German trade has grown steadily over the years: Exports grew at an average rate 13.5% above import growth, and the sum of exports and imports as a proportion of GDP grew by 41.6% (25, 5 pp).

Statistics highlight the important role that exports and international trade play in the German economy. Thus, the aim of the present paper is to assess whether and to what degree German exports are conditioned by the behavior of external demand. In order to achieve the objectives, it is necessary and justifiable to understand the main socioeconomic and political elements, as well as the internal and external actors, capable of elucidating the unfolding of recent German economic history. The importance of research is revealed as the successful performance of Germany's economy can be used as a growth strategy for other countries or regions.

Thus, after this introduction, the second section of the article will deal with the resurgence of a reunited Germany as a threat to the European powers, which seeks in postwar forces the parallel change of perspective that has been engendered and the redirection of strategies to the sphere of greater cooperation in international relations and foreign trade, facilitated by an international environment under institutional restructuring. In addition, the second section will also look at the weight of the provisions of the Reunification Treaty and the unprecedented and exceptional increase in the scope of the German welfare state in relation to public finances. It should be noted that the scope of the state proved decisive for the political and economic reformulations in the country that began after the second half of the 1990s (from the opening clauses agreements) and, most significantly, from the 2002 proposals. In this instance, we will seek to show how the reforms that the country's labor market went through in those years are relevant to explaining the momentum that the country's exports gained. The section will also address the loss of relative importance of domestic components of aggregate demand at the expense of the country's exports, the scientific underpinning of wage restraint in sectors that require less skill, and the way the labor market and the external sector intertwine to explain the reconfigurations of the German national accounts.

In the third section, the focus will be on the methodology and data, initially presenting the proposed model for hypothesis testing and econometric investigation, and later performing the application of the tests and the analysis of the results obtained. Then, the fourth section will present the analysis of the results mentioned. Finally, the final considerations of the work seek, aside from condensing the essence of the literature used in the research, to reflect on the conception of analysis from elements that history shows to be indispensable, capable of contributing to a better understanding of the formation process and the recent development of the German economy, thereby stimulating discussions and inciting debate about the proposal of economic practices that categorically always go hand-in-hand with political choices.

2. GERMAN REUNIFICATION: A BRIEF HISTORY, POST-TRANSITION ECONOMIC CONDITIONS AND THE EVOLUTION OF THE COUNTRY'S EXPORTS

2.1. The New Proposal for International Reintegration

According to Maull (1990) the insistence on reunification contributed to the 1969 political slogans that voiced and mobilized nationalist sentiments which explicitly acknowledged the existence of a single German nation instead of a divided Germany and Europe. –The peaceful change of government that year proved the advances of democracy in the country. In his analysis of Timothy Garton Ash's book, *In Europe's Name: Germany and the Divided Continent, 1993*, Craig (1994) sets out the main elements of the work. At first, the author interprets Ostpolitik as the policy adopted by West Germany in its effort to overcome the East-West division. The period to which the author refers regards the initiatives of Willy Brandt as chancellor of the Federal Republic of Germany (FRG) from 1969.

Brandt's energetic and consistent strategy was centered on German reunification, the reduction of East-West barriers, and the pursuit of peace by explicitly recognizing the existence of sovereign states to the east and, paradoxically, the German Democratic Republic (GDR). For his government's head adviser on foreign affairs and politics, Egon Bahr, no such improvement could be expected without the support of the Soviet Union (USSR) and, as a reward for supporting closer relations between Bonn and Berlin, this country was expected to compensate the eastern European states for their greater participation and engagement throughout the process. Even in 1990, trade

between the GDR and the USSR accounted for 25% of total East German exports (or 15% of its workforce destined, directly or indirectly, for export activities to the eastern partner) (Burda, 1990).

This is how Ostpolitik can be properly, but not solely, understood as an instrument for promoting foreign trade and creating closer ties between the "blocs" through exchanges in the last two decades prior to reunification in 1990 (Craig, 1994). Indeed, the postwar forces of change brought new concerns to the international scene, and the dynamics of international relations shifted from the military-political sphere to economic and social developments, a change that favored Germany in its strategy of seeking economic gains abroad and thus replacing the notion of power as the capacity for imposition and command with the idea of power as an instrument of persuasion in the social and economic spheres (Maull, 1990). Germany then relinquished its power of autonomy in the establishment of security policies and bet on advances from a perspective of greater interdependence, negotiation and international cooperation. Even after reunification, in a democratic, economically integrated state, solidly anchored in the European Economic Community (EEC) and concerned with regional development issues, the chances of military nostalgia seemed to border on the impossible: In 1970, according to Flora (1983) the number of people employed by active military units was lower than in 1887. It is in this context that Maull (1990) coined the term "civilian power," which implies (1) the acceptance of the need for cooperation between countries in the pursuit of international objectives; (2) concentration on primarily economic means – hence, similarly, the term "trading state" arises – to secure national interests; and (3) the desire to create supranational structures to address issues of international interest.

Moreover, for countries with their traditional nation-state ambitions frustrated and renouncing their national defense sovereignty, directing energy to international trade seemed to be the best form of economic resurgence. After all, US strategies of communist containment by the end of the Cold War guaranteed financial support and a stable, trade-friendly international environment (Maull, 1990). At this juncture, a reunified Germany in central Europe is gaining importance because even with its energies and resources temporarily absorbed by the rehabilitation process of the former GDR, the imbalances that existed between the three (or four) largest countries in Europe would be broken. Reunification would soon put Germany, not France, at the heart of European issues (Kundnani, 2015).

The geopolitical realities and transformations of foreign policy parameters would change as dramatically as the changes that occurred after the unification in 1871. To this end, Europe should be properly regarded as an "alliance of ancient world cultures and powers seeking a way out of their tradition" (Beck, 2015) and deepening European integration would then be the best approach for dealing with the possibilities of reopening the German Question. As Hobsbawm (1990) noted, the reasoning that developed behind the conception of nation in the nineteenth century was directly associated with: (I) the historical relationship with an existing state; (II) the existence of a long-established cultural elite with an administrative vernacular and written literacy; and (III) a proven ability to conquer as Darwinian proof of evolutionary success. There were rather inaccurate perceptions of these ideas that, even at the end of the twentieth century, brought together elements for discussions that questioned whether the national characteristics and territorial dimension of the newly unified country would become a destabilizing rather than a stabilizing force in Europe if the Economic and Monetary Union (EMU) had not occurred. After all, it is no secret that until 1989, the formers United Kingdom prime-minister, Margaret Thatcher, and France president François Mitterrand, did not want reunification to happen (Sinn, 1996).

2.2. The Transition Period: New Economic Miracle?

In 1990, East Germany joined the GDR under conditions of economic, monetary and social integration. Economically, the beginning of the process was seen as adding labor – 8.5 million workers, land, and obsolete capital stock (70% of the industrial equipment used was more than 10 years old) – to West Germany (Siebert, 1991). Generally speaking, the provisions of the Reunification Treaty could be defined under 8 main responsibilities: (I) the

introduction of Deutschmark (DM) in the GDR and the consequent conversion of Ostmark (OM) by exchange rates ranging from 1:1 (for salaries, pensions and government transfers, no exceptions) to 3:1 (for non-resident bank accounts); (II) the transfer of functions from Staatsbank (Central Bank of Germany) to Bundesbank, the Central Bank of Germany; (III) the adoption by the GDR of the West German tax system; (IV) the adoption by the GDR of Social Security and Unemployment Insurance (or generally the welfare support institutions) of the FRG; (V) the privatization of public enterprises, with a view to reducing government representation in the economy; (VI) the establishment of a market and market-oriented system; (VII) the establishment of agreements to allow unrestricted sales and purchases of land and to decide on refunds to previous landowners; and finally, (VIII) the fulfillment of all contractual obligations by the GDR concerning the Council for Mutual Economic Assistance (COMECON) countries (Burda, 1990).

Immediately, the impact of the currency conversion of assets implied increased liquidity in the newly expanded currency zone. However, attention to the inflationary dangers posed by this liquidity increase did not have to be overstated as increases in the former GDR's unemployment rates were expected in the years following reunification, which was expected to amount to 2 million people (or 23.5% of the total available workforce at the time). The turmoil in the transitional period would help to lead to preventive savings rather than consumer surges and, should the Bundesbank decide to continue to pursue a restrictive and independent monetary policy, interest rates should rise, as well as the influx of capital (Burda, 1990).

Moreover, to alleviate concerns about the possibility of inflationary pressures, it was noted that in 1990, the newly unified Germany did not meet the same take-off conditions as those available to Germany after 1945. Right after World War II, German income had been reduced by one-third and unemployment had risen, and in that scenario, the Social Market Economy, a model of economic policy adopted in the period, was a response to the economic crisis and an attempt to balance liberal market practices – which started with relatively greater strategic weight through the abandonment of price control – with welfare state policies through the collaboration between the private and government sectors (Dornbusch, 1993; Porter, 2010).

Essentially, the decade between 1950 and 1960 was defined by the dynamism with which West Germany managed to keep up with the evolution of the world economy (the German Economic Miracle). At the time, in the international order, institutional changes were of great importance for the resumption of the country's growth, since the parity defined between the German mark and the dollar at the Bretton Woods Conference in 1944 and the clear rules for trade established from the General Agreement on Tariffs and Trade in 1948 boosted the country's exports.

The favorable conditions for reconstruction and mobilization of real capital – facilitated by the Marshall Plan – and people at that time contributed to the constitution and recovery of a diversified industrial base, since the evolution of labor-related costs remained much lower. Although productivity jumped and social security costs were still relatively low, foreign investors were motivated to invest in the country, and capital accumulation made it possible to form large and medium-sized enterprises (Lang, 1990).

For Lang (1990) crucial to the success of the German economy from the second half of the 1940s were the real conditions of domestic and, especially, international economies at that time. Internally, only 20% of the country's industrial potential had been destroyed and the stock of human capital was still substantially intact, although scattered: 12 million refugees pessimistic about the country's future and therefore aware of the conditions to which they would be subject as soon as they decided to return to market activities.

It was these mechanisms of feedback from the dynamism of the internal and external economies, of surprise and surpassing the pessimistic expectations of the population that revitalized and strengthened a process of sustainable development for the German economy over the two decades after 1945. Between 1947 and 1966, the country's per capita GDP grew by an average of 7.58% per year (p.a.) in real terms, or by an accumulated real growth of 285.37%

and, according to the coefficients of variation obtained separately for each period Table 1, at increasingly consistent average rates (Maddison Historical Statistics, 2018).

Table-1. Descriptive statistics for German real per capita GDP (US$, 2011) between 1947 and 1977.

Statistic	1947–51	1952–56	1957–61	1962–66	1967–72	1973–77
Period growth (accumul.)	72.65%	35,66%	22,49%	14,18%	16,38%	9,24%
Period avg. growth	13.73%	8,00%	5,20%	3,38%	4,10%	2,65%
Period avg. (US$, 2011)	6.722,4	10.778,4	14.570,2	17.778,2	21.696,2	24.978,6
Standard deviation	1.470,1	1.326,8	1.251,8	1.010,3	1.248,7	988,0
Coefficient of variation	0.2187	0.1231	0.0859	0.0568	0.0376	0.0396

Indeed, from the very beginning, between 1946 and 1947, West German output grew steadily and, more specifically, on average by 11.2% per quarter (p.q.) in real terms. In addition to maintaining 80% of the country's industrial capacity, other arguments that explain the growth in industrial production and productivity from that moment on were the liberalization of price mechanisms and, for the increase in industrial output, the resumption of coal production.

Yet, despite the most optimistic of statistics, according to Balogh (1950) the German industrial production index in the first quarter of 1950 was 10% below that observed in 1936. Only in 1954 did the German per capita GDP approach the 1939 indicator (US$ 10,921, at constant 2011 values). For the post-1980 period, average income continued to rise but at much lower rates than in the first two decades after World War II.

Table-2. Descriptive statistics for German real per capita GDP (US$, 2011) between 1978 and 2007.

Statistic	1978–82	1983–87	1988–92	1993–97	1998–02	2003–07
Period growth (accumul.)	4,34%	9,58%	3,94%	5,89%	6,22%	9,45%
Period avg. growth	1,45%	2,26%	1,40%	0,83%	1,61%	1,68%
Period Avg. (US$, 2011)	28.180,6	30.472,0	33.149,6	34.433,6	37.440,4	39.398,2
Standard deviation	572,2	1.103,2	716,8	739,2	1.011,9	1.480,7
Coefficient of variation	0.0203	0.0362	0.0216	0.0215	0.0215	0.0376

Importantly, historical circumstances alone obviously made the situation completely different from 1948 and, therefore, there would be a potential risk of misunderstanding in any attempt at analogy. Until unification, East Germany remained almost exclusively integrated with the centralized economies, while the FRG moved closer and closer to the West. Moreover, during the transitional period (1990–1991), the observed trends in industrial production, trade sales and unemployment for East and West Germany even seemed to correlate negatively.

2.3. The Weight of Reunification

For 1991, government transfers from West to East Germany were expected to amount to DM117 billion, 160% above the 1990 budget, of which only 15% would go into infrastructure investment per se. This would be the portion, complementary to that intended for consumption, from which future tax revenues could be expected (Siebert, 1991). By 1990, the former GDR's economy had absorbed DM235 billion above its production value in terms of consumption, investment and public spending on goods and services, and approximately two-thirds of that amount was derived from public transfers, of which most were focused on social security. In 1995, the per capita resource absorption for the newly unified East was 160 times greater than that for all former members of the Eastern European bloc. In the first 6 years after reunification, for an optimistic estimate, approximately DM800 billion of public resources were dumped in East Germany (Sinn, 1996). No actions were taken towards the balance equilibrium, such as the rise in rates and taxes, and as a result, German public debt jumped from DM928.8 billion in 1989 (41.8% of GDP) to DM1994.5 billion (or 57.7% of income) in 1996 – a 114.7% change in the amount of accumulated debt. By the end of this year (1996), the debt-to-GDP ratio had grown to 61%, in violation of the upper limit set by the Maastricht Treaty.

The exceptional increase in the scope of the German welfare state deepened the country's deteriorating public finances and resulted in an even less flexible and more expensive labor market. In addition, in comparison to Japanese and American workers, Germans worked on average 30% less. After the six years following the monetary union in July 1990, the average real wage of East German workers aged 18 to 54 had grown by 83%, but on the other hand, the unemployment rate rose from 11% to 27% for the same group. Initially (1990–1991), parity and wage-leveling measures had little effect in preventing east-west emigration, but over the next 5 years (until 1996) the gains from these movements tended to regress further and these lags, in addition to making these flows less advantageous, did not contribute to a rapid recovery in employment rates. As a result, unemployment insurance payments continued to brutally burden public accounts (Sinn, 1996; Hunt, 2001).

The promise to bring the East German population the same standard of living as the Westerners brought high costs and led to the destruction of the manufacturing industry in the unified eastern states: according to Sinn (1996) 4 out of every 5 manufacturing jobs available before reunification simply disappeared without replacement in the economy, and output in that sector was drastically reduced by two-thirds. Discussions on labor market rigidities and the need for political and microeconomic reforms tended to be perpetuated throughout the 1990s, and many turned to labor cost metrics for productivity gains. Thus, those surveys would be directly associated with the analysis of the effects on the international competitiveness of German products.

2.4. Reforms, Flexibility in the German Labor Market and International Competitiveness

The main statement behind the rhetoric of the need to deregulate the labor market, reduce the scope of the welfare state and the level of taxes was that maintaining relatively high wages and imposing social security contributions on employers would place an intolerable burden on business and discourage direct investment in the country. It was the consensus among the most politicized, and the most accepted in the case of unions and industrial leadership, that gave rise to the emergence of greater economic liberalization (Menz, 2005).

In 2002, the newly created Hartz Commission proposed a series of reforms – 13 measures – of which the most important recommendation was to integrate unemployment (financed in the first 32 months by workers and employers and, in case of expiry of eligibility, by the federal unlimited-time budget) and social benefits (administered and funded by municipalities), promulgated in 2004 as Hartz IV and amalgamating their contributions into a flat-rate. In addition, anyone who had been unemployed for more than 6 months would be given a temporary job by specialized agencies in a private company (Streeck and Trampusch, 2005). Following the 2002 elections, two acts promoting modern services in the labor market (commonly referred to as Hartz I and II) determined which jobs an unemployed person would be entitled to decline and the conditions necessary to adhere to eligibility for unemployment benefits. In addition, the reforms raised the income limits of low-paying jobs to exempt them from social security contributions.

In March 2003, Chancellor Schroder announced Agenda 2010, a package of measures intended to make the German economy more flexible and competitive. These included reductions in the generous unemployment and sickness benefits and the proposal to facilitate resignation and hiring procedures for small businesses. Two other acts (Hartz III and IV) relaxed employment protections for the same group of companies and reduced the duration of unemployment benefits from 32 to 12 months (18 months for people over 55), but only in 2006 did these rules come into force due to the requirements of a 25-month transitional period. Regarding labor cost developments, the appreciation of the euro after 2000 had no significant influence on unit labor cost (ULC, a productivity-related labor cost measure) as Germany saw indirect cost reductions and increased productivity. While between 2000 and 2011, unit labor costs increased by 20% to 30% for most Eurozone countries, in Germany the index increased by less than 3% (Thorbecke and Kato, 2012).

Indeed, between 1994 and 2009, the German economy witnessed a 20% real devaluation of unit labor cost relative to its European competitors, achieved by combining plant-level restructuring and changes in economic

policy that resulted in reduced costs and increased labor productivity without hurting the most qualified base in manufacturing (Hassel, 2014).

According to Dustmann *et al.* (2014) much of this success is due to the unique characteristics and transformations that labor market institutions had undergone in the country. These gradual changes in the modus operandi of the industrial relations governance system and structure – the drastic drop in the number of workers covered by trade union agreements (from 75% in 1995 to 56% in 2008) and the clear increase in the number of workers in advance agreements registered at firm or even individual level from the second half of the 1990s onwards – led to an unprecedented decentralization of industrial relations processes in that country from the regional and industrial levels to the firm level ("micro- corporatism"), without the direct influence of the government. In other words, there was a push for greater flexibility with the maintenance of the German institutional structure, resilient to the point of obscuring the changes that actually led to further liberalization of the economy. Even the economic crisis of 2008 reinforced the central strategies and institutions of the German economy (Beck and Scherrer, 2010).

Compared to 1990, by 2000 the number of companies managing firm-level agreements had grown by 151.6% (from 2,550 to 6,415). Moreover, even in 2000, for new economic sectors such as general and business-related services, 52.7% (76.3%) of all companies in West (East) Germany were not covered by sectoral agreements. Just as, at some point in the 1980s, unions lost the ability to contain the pressure to differentiate in the labor market, the welfare state was not prepared to embrace these new forms of employment (Menz, 2005; Eichhorst and Marx, 2011). However, in the end, even the heavy costs associated with reunification and the relative underperformance of the German economy in the last decade of the twentieth century were overlapped by new access to eastern European neighbors, with relatively low labor costs and increased German competitiveness since 1995. The 3.9 percentage point drop (from 21.6% to 17.7%) in the number of jobs supported by the German manufacturing industry and the maintenance of value added by the sector between 1995 and 2007 indicate an increase in labor productivity. Moreover, in the same period, there was a substantial increase in the value of products from other industries and sectors added to manufacturing (from 66.1% to 72.9%).

Ultimately, the sharp decline in the share of workers protected by trade union agreements and the increase in opening clauses records (clauses that allow the firm to move from regional and sectoral collective agreements to more granular levels of bargaining, provided that they were with employees' consent) accounted for declines in real wages observed at lower levels of wage distribution. For example, between 1993 and 1999, the number of industry and construction employees under opening clauses grew from 0.6 million to 6.6 million. In other words, this agreement module – originally reserved for exceptional situations, or for companies in financial distress – turned out to be an ordinary tool for industries adopting more traditional forms of full-time jobs in response to external flexibility and new forms of employment (Eichhorst and Marx, 2011; Dustmann *et al.*, 2014).

Fiscal liabilities and net transfers from the former West Germany to East Germany, coupled with a more competitive international environment, were increasingly raising the burden of wages on direct business costs and access to the Eastern European labor market (to countries with similar educational and training characteristics as the West). The possibility of exporting production to these countries forced much greater wage flexibility in Germany than in other EU member countries, as the process of German reunification and the geographical position of the country made the German response to international economic and political changes much more significant when compared to other continental European countries (Dustmann *et al.*, 2014). It is in this sense that, once exposed to international competition, companies with a greater propensity to export tended, through greater use of installed capacity, toward economies of scale and incentives for more intensive use of technologies and to expect faster product growth and higher levels of growth in productivity. Indeed, Germany has increasingly relied on foreign markets to support the manufacturing sector and income growth (Bernard and Wagner, 1997).

2.5. The Reconfiguration of National Accounts and Export Growth

Between 1991 and 2017, Germany's income grew on average by 1.31% p.a. in real terms. The per capita income of the country grew 1.17% p.a. and the unemployment rate, after its peak in 2005 (10.31%), showed a declining trend until the end of the analysis period when it approached 3.5% of the total economically active population. The private sector Gross Fixed Capital Formation (GFCF) grew 1.25% p.a. and the country's total exports (goods and services) grew 3.73% p.a. Table 3.

Table-3. Average annual growth of selected variables of the German national accounts for the period 1991–2017.
(Index number: 2010 = 100)

	Avg. growth (%)					Avg. (%)
Period	**Income**	**Per capita income**	**GFCF**	**Total exports**	**Imports**	**Unemp.**
1991–2017	1.31	1.17	1.25	3.73	3.49	7.03
1999–2017	1.38	1.26	1.22	4.37	3.94	6.77
2010–2017	2.16	1.75	3.13	5.83	5.38	4.79

The advance of German manufacturing exports caused a turnaround in the German economy. In the second half of the 2000s, when Angela Merkel succeeded Schroder as chancellor in 2005, unemployment began to fall from its peak of 4.8 million, but the tremendous revitalization of manufacturing in the country and the maintenance of domestic demand at relatively low levels, due to greater flexibilities in the labor market and wage restraint policies, further deepened the country's dependence on exports. By the end of the decade, the German economy was structurally dependent on external demand for its growth (Kundnani, 2015).

Since 2006, unemployment has fallen faster than in any other post-World War II period, from an average of 4.8 million unemployed in 2005 to 3.2 million in 2008, the lowest level since 1992, and much could be assigned to low-pay work (below the two-third limit of the average hourly pay). The share of highly skilled low-paid workers grew from 58.5% in 1995 to 70.8% in 2007, which attests to the effects of reforms not just among low-skilled workers. Yet, job activation policies do not seem to have been the effective solution to the structural problems of the German labor market: In 2010, among the countries of the Western world, Germany was one of those with the highest unemployment rates among the non-qualified employed (Hassel, 2014). Nevertheless, for the country, the period between 2010 and 2017 was the one with the highest average growth, even by European standards. While other EU countries were plunged into post-crisis debt, Germany was on its way to success, leading with economic growth of 3.7% and 3% respectively in 2010 and 2011, double the European average. Regardless of the social consequences of the austerity measures adopted, the economic policies proposed by the country were recommended abroad (Beck, 2015).

In the same period (1991–2017), private consumption as a proportion of income remained virtually unchanged: In 1991, 56.6% of products were accounted for by private spending, and in 2017, the amount was 52.7%; government spending, as steady as it was, remained at around 18.9% of income and the proportion of total investment closed 2017 at a level 6.3 ppt below the first quarter of 1991, which was 19.8%. It is important to highlight that this did not mean a drop in investments, since in real terms, private and public investments grew 1.25% p.a. and 0.27% p.a., respectively, between 1991 and 2017. While the other components of demand grew more proportionally to the expansion of investment, it was logically expected that the proportion corresponding to the latter will fall over time, and indeed, in recent decades, the external sector has shifted to draw more attention with the sacrifice of internal expenditures.

Germany relied on an export-led growth model and the competitiveness of this sector to the detriment of political and institutional coalitions and wages, especially in the service sector, and hence domestic demand. A larger share of income for wages rather than for other types of income where the marginal propensity to consume is lower would, ceteris paribus, imply increases in domestic prices relative to external prices and thus appreciation of the real exchange rate. The most obvious explanation for the existence of this trade-off between exports and

domestic demand is that there is a greater sensitivity to price fluctuations in the country's export products. In this sense, in order to avoid an appreciation of the effective real exchange rate (REER), we are moving towards the political choice of repression of wages and, therefore, of private consumption (Baccaro and Pontusson, 2016).

Between 1991 and 2017, the value of total German exports grew in real terms (2010 prices) by 97.06% or, on average, 3.73% p.a. In the first 5 years (March 1991–December 1995), growth was 5.00%, while in the next 5 years – until the last quarter of 2000 – the rate was 25.61%. This means that the average growth in the last period was 5 times higher than the average growth of the initial analysis period. In the first 5 years of the 21st century, exports grew by 22.72%; between the first quarter of 2006 and the last quarter of 2010, the growth was 19.63% and, between 2011 and 2017, the value resulting from the country's exports increased by 31.89%. The figures prove that there has been a persistent evolution and brutal increase in the growth rate of this component of the country's economy over the past 27 years.

Table 4 presents the descriptive statistics of German exports between 1991 and 2017. While the evolution of the series showed an unwavering increasing trend over time, except for 2009, the indicators of variability – standard deviation and coefficient of variation – indicate greater fluctuations in the variation of this growth. The US Financial Crisis (sub-prime) and European (indebtedness) may in part justify this increase in dispersion.

Table-4. Descriptive statistics for German total exports (1991–2017) – quarterly data (Index number: 2010 = 100).

Statistic	03/91–12/95	03/96–12/00	03/01–12/05	03/06–12/10	03/11–12/17
Period growth (accumul.)	5.00%	25.61%	22.72%	19.63%	31.89%
Period avg. Growth	0.25%	1.28%	1.14%	0.98%	1.14%
Avg. variation (%)	0.26	1.21	1.02	1.02	1.12
Period avg. (Bi. Euros)	95.64	134.28	190.56	260.01	340.07
Standard deviation	6.04	19.32	18.03	21.38	28.51
Coefficient of variation	0.06	0.14	0.09	0.08	0.08
Exports/GDP	21.8%	26.5%	34.1%	41.6%	46.1%

For Sinn (2006) this export boom and weak domestic growth should not be considered as unassociated events. On the contrary, it is thought that they are closely and economically related in a process of market development marked, if at all, by wage rigidity. The natural reaction of competitive companies to this scenario would be to deepen the degree of substitution of labor for capital; outsourcing and offshoring, especially in nations that had recently joined the EU, where the cost of working hours approached 13% of the German wage cost. These processes of industrial displacement and outsourcing transformed the German manufacturing industry. More and more German manufactured goods were produced outside the country and only assembled within its borders. This was good for the economies of central Europe, which benefited from investment, training and job creation. But it also means that these countries have become part of the German supply chain and thus integrated into the "largest German economy" that has improved the country's competitiveness relative to other Eurozone economies. Not only were these countries more economically integrated into the European economy, but their interests became more closely tied to German interests, resulting in an increase in German power within the EU (Kundnani, 2015).

Regarding the specificities of German exports, between 2000 and 2017, it was possible to observe a decrease of 10.1 ppt of the share of exported goods over the total exports of the country. Regarding this, which is not limited to the scope of this work, it may be worth returning to the evaluations of reforms in the German labor market in recent years and the arguments about wage restraint in other sectors of the economy to understand the depth of the relationship between domestic factors and foreign trade performance. By contrast, for the total of exported goods, there do not seem to be major changes in the export basket by category: In 2000, 88.3% of exported products were finished goods, whereas in 2017, 86.3% of product destined for other countries fell into the same category. For the period 1991 to 2017, it was shown that it is possible to highlight the growth of German exports and the relative importance, in the international context, of that country's trade with the world. After all, the country in which real

exports grew at an average rate of 3.73% p.a. for 27 years deserves attention since it is responsible for more than 25% of exports from the largest bloc in which it is contained (EU).

Between 2000 and 2017, exports of goods (at current values) grew by an average of 4.9% p.a., and it is because of this that it is imperative to consider that institutional and socioeconomic flexibility and political background may dominate over lower relative price preferences. Therefore, understanding whether and to what extent German exports in the period 2000–2017 are conditioned by the behavior of external demand becomes the central research problem. The possibility of statistically and historically corroborating the sensitivity of the country's exports to world income allows the indication of economic policy paths that can be avoided or replicated.

2.6. Technology and Productivity as Rebound Factors

While the dominant narrative focused on labor market reforms, welfare state deregulation, fiscal austerity and, as an effect, strong cost and price competitiveness via reduced relative unit labor costs, Storm and Naastepad (2015) argue that the remarkable German recovery in the post-2008 crisis should be explained in terms of Germany's technological superiority, i.e., the high competitiveness gains through non-price competitiveness: Since the second quarter of 2009, the German economy has grown extraordinarily. It was the country with the biggest GDP drop, followed by the fastest recovery among OECD economies and the only one that emerged from the crisis with a lower unemployment rate than the pre-crisis period (Hassel, 2014).

It should be noted that Germany is dominating the world market for medium and high technology services and manufactured goods, with a market share of 18% of total world exports of the top 100 most complex products, against 3.6% from France, 3.1% from Italy and 0.9% from Spain. However, according to Storm and Naastepad (2015) if Germany were compared to the Eurozone (EZ), there would be no signs of wage tightening, but in line with the ongoing changes in the labor market there, it would be relevant to highlight the detachment between hourly productivity in Germany and the levels in the EZ countries. For the authors, the comparative fall in relative unit labor cost (still 7.4% higher) should be completely attributed to the exceptional performance of German productivity (Beck and Scherrer, 2010).

In short, it is characteristic of the recent German labor market that there is a growing dualization in which a coordinated (manufactured goods) core – with a paradoxical strengthening of employment protections for highly skilled and productive workers, technology incentives and international exposure –benefits at the cost of a less regulated, less socially supported and more flexible sector (service). While there is no job growth in the former (manufacturing), on the contrary, the latter (the service sector) would act as a recipient of excesses, and it is this outlook that accounts for growing social inequality in Germany (Storm and Naastepad, 2015). According to Hassel (2014) the decline in real wages in the service sector is directly associated with weak domestic demand and explains the German economy's dependence on its exports. Growing institutional specialization towards a dual economy led the country into this external demand-dependent development trap and created a highly skilled export-oriented industry that also depends on a favorable domestic environment provided with low costs in the service sector and salary controls.

If this is the sector that receives the excesses of the labor market today, until the first half of the 1990s because it was labor intensive, it was the one that suffered the most from disincentives to job creation in the private sector, considering the impediment to economic growth created by high non-wage costs (mostly retirement pensions and unemployment insurance). Even from 1995 until 2003, these costs had increased by 2 ppt (Streeck and Trampusch, 2005). Due to the supposed sensitivity of demand to the prices of their products, exporting companies in the country were less willing to meet the wage claims of their own employees and tried to politically ensure that possible wage increases that accompanied sector productivity increases did not spill over to other sectors of the economy, greatly impacting wage costs and influencing price levels. Thus, wage compensation for less-skilled services relegated to the service sector (retail, restaurants and hotels) was compromised, remaining constant or

even declining since the mid-1990s. While more skilled workers could experience an increase in their purchasing power in the period, the less qualified, even with the maintenance of relatively low domestic prices, noticed a deterioration in their purchasing power (Baccaro and Pontusson, 2016).

German growth has become heavily dependent on net exports, with higher growth in technologically competitive product exports offsetting the loss of demand growth and private investment, which can be explained by recessionary policies and the collapse of the German financial market (Neuer Markt) in 2000. Wherever it is, Germany has stood out due to the competitiveness gains that undeniably gave its exports even more momentum in recent years (European Commission, 2010).

3. METHODOLOGY

3.1. Data Description and Definition of Variables

In cases where data analysis is essential to the achievement of the research objectives, the process of scientific investigation – and hence hypothesis testing – should consist of at least (1) assessing data availability needed for the study; (2) the impartial interpretation of the data generating process, that is, the very behavior of the research phenomenon; (3) the analysis of data and relationships in their entirety, and (4) the consistent presentation and description to the public. Therefore, in order to avoid a priori the compromise of the econometric study and so that the exact direction of the tests would not be impaired a posteriori, it was found that, considering the sensitivity of exports to external demand, no consolidated data are available in the same currency for major trading partners before 1999 (the official Eurozone creation date).

Moreover, it is understood that an analysis focused on manufactured exports could serve the purposes of the work, since of the total exports of goods from the country between 2000 and 2017, 86.7%, on average, was represented by trade. For manufacturing, it was decided to select 2000 as the beginning of the analysis period instead of 1999, the year in which the euro began to circulate as the official currency in that country. Thus, the delimitation of the theme over time takes place between 2000 and 2017, and data for the analysis-dependent variable (German exports of goods) were collected from the Eurostat European data portal in millions of euros at current prices. For practical purposes, the term "goods" was omitted and, in the course of the search, the variable will be described only as "*German exports*" (xt).

The International Monetary Fund (IMF) provides quarterly data on world income growth. However, for quarterly dollar statistics, the basis consulted was the Organization for Economic Cooperation and Development (OECD). For international demand data, as a proxy, income data from OECD member countries (except Germany) - yt - will be used without adding or deleting them from the series in order of entry, since the proportion of income of the five members admitted between 2001 and 2017 (Chile, Slovenia, Israel, Estonia and Latvia) is hardly representative of total output: Over the years 2000–2017, the combined income of these countries did not account for 2% of total income of the group. In units, data are in Millions of Dollars at current prices, on an annual and seasonally adjusted basis.

Surprisingly, between 2012 and 2017– due to the cumulative fall of 24.93% between July 2008 and the same month of 2009 – the average growth of German exports was 28.17% and 59.61%, respectively, below average growth in the periods 2006–2011 and 2000–2005. Only in the last 6 years did exports grow at an average rate below the world income Table 4. The main strategy of the German model, which has been increasingly dependent on the growing success of its exports since the mid-1970s, would also prove to be the Achilles' heel of its economy (Beck and Scherrer, 2010).

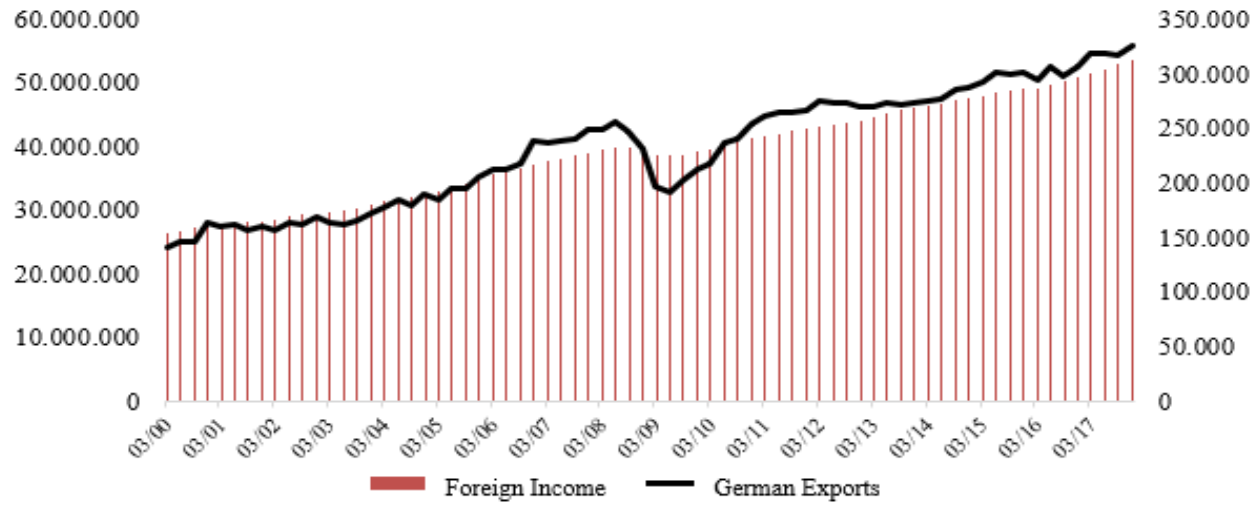

Figure-1. German exports (in €Million, current prices) and external income (in US$ Million, annualized, current prices) – quarterly data (2000 to 2017).

However, in values, the average in the last period (2012 – 2017, 6 years) was, respectively 23.85% and 71.05% higher than the other analysis periods. Between 2012 and 2017, foreign income grew on average at rates 18.56% above the average between 2006 and 2011, but 25.17% below the average growth of the period 2000–2005. While for four consecutive quarterly periods exports fell, only in two successive quarters (a cumulative fall of 3.34%) to the 2008 crisis was it possible to see reductions in world income. The recovery of German exports to the pre-crisis level took 21 months, while the recovery of world income to a pre-crisis level was twice as fast (1 year). Still, the upward trajectory of the series does not appear to have been interrupted Figure 1, even after the 2008 financial crisis.

3.2. Econometric Model

The Autoregressive Distributed Lag (ARLD) methodology and the bounds test for cointegration by Pesaran *et al.* (2001) and Pesaran *et al.* (2001) have some characteristics that give them advantages over more conventional cointegration tests (by Engel-Granger and Johansen, for example, which assume the same order of integration for variables). Therefore, the ARDL methodology and limit tests can be used for the analysis of the relationship between variables I (0) and I (1) combined, as well as the configuration of a single equation, which makes the implementation and interpretation of the results simpler, and admit different numbers of lags for the explanatory variables of the model.

In addition to the factors mentioned above explaining the due importance of this methodology in the analysis of non-stationary time series, Nkoro and Uko (2016) highlight the robustness of the model in identifying a cointegration vector when multiple vectors are considered. The general formulation for the unconstrained ECM model is as follows:

$$\Delta Y_t = \delta_{0i} + \sum_{i=0}^{q} \alpha_1 \Delta X_{t-i} + \sum_{i=1}^{p} \alpha_2 \Delta Y_{t-i} + \delta_1 X_{t-1} + \delta_2 Y_{t-1} + v_{1t} \qquad (1)$$

As described in Equation 1, the dependent variable can be a function of a constant δ_{0i}, its past values (p) and the current and lagged values (p) of the exogenous variable in the model. In addition, a key assumption for this methodology – beyond the prerequisite that no variable should be integrated in order 2 (I(2)) – is the presence of zero autocorrelation of the residues. For the purposes of this study, logarithms will be applied to the variables in order to interpret the results based on the concept of elasticity and reduce heteroscedasticity. In this context, Figure 2 presents the two variables used in the study after logarithmic transformation.

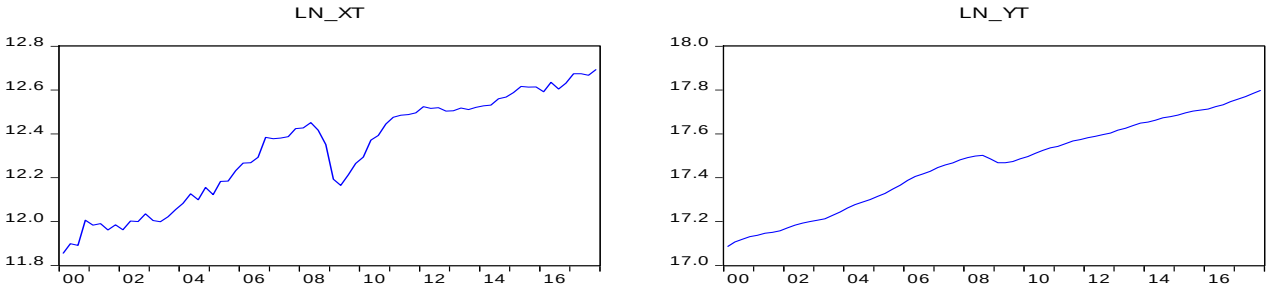

Figure-2. German export logarithm (ln_xt) and world income (ln_yt) for the period 2000–2017.

In the following approach, for the cointegration test in an ARDL model $(p, q_1, q_2, \dots, q_k)$, k is the maximum number of lags chosen and, while α_1, α_2 and Δ represent respectively the short-term dynamics and the first difference of the (stationary, it is assumed) series of the model, δ_1 and δ_2 correspond to the long-term relationship. Therefore, in order to proceed with model specification and long-term elasticity analysis of the relationship and, therefore, for the Granger cointegration and statistical precedence tests, the series Figure 2 must be subjected to the unit root test for verifying the order of integration and, if necessary, assessing the appropriate methods for making them stationary.

The tests in Table 5 indicate nonstationarity of the world income series (ln_yt). However, from the constant and biased test statistics for the German export series (ln_xt), it is not possible to reject the hypothesis of stationarity at a 5% significance level. The series is stationary in its tendency or, in other words, has a deterministic tendency.

Table-5. Unit root test (Dickey-Fuller-GLS) in the German export (ln_xt) and world income (ln_yt) series.

		Critical values (with constant)		
Variable	**t-Statistic**	**1%**	**5%**	**10%**
ln_xt	0.935455	-2.597939	-1.945456	-1.613799
ln_yt	1.389230	-2.598416	-1.945525	-1.613760
		Critical values (with constant e trend)		
Variable	t-Statistic	1%	5%	10%
ln_xt	-3.364698	-3.697800	-3.129200**	-2.833000
ln_yt	-2.167674	-3.694000	-3.126000	-2.830000

Thus, in view of the objective of making the series stationary, German exports use a simple regression (OLS) of the series against time and the residuals of equation (ε) become the differentiated series, or detrended, disregarding the effect of the trend, and the variations observed for the series will characterize a positive or negative organic growth of the series.

$$ln\_xt = \alpha + \beta time + \varepsilon \qquad (2)$$

The new unit root tests to evaluate the order of integration of the series will be performed on the residues obtained from Equation 2 ($dest\_ln\_xt$) and on the first difference from the world income series (Δln_yt). The behavior of the transformed series is presented in Figure 3.

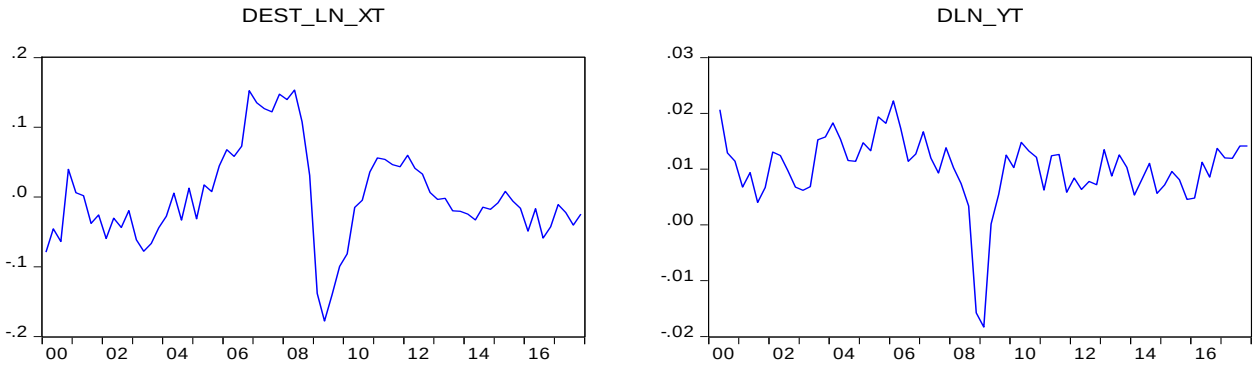

Figure-3. Detrended German exports series ($dest\_ln\_xt$) and first difference from the world income series. (Δln_yt) 2000-2017.

The results presented in Table 6 indicate that, at a 5% level of significance, it is not possible to reject the hypothesis of stationarity of the German export series and world income after being, respectively, distorted and differentiated for both the constant test and for that performed after the addition of a trend.

Table-6. Unit root test (Dickey-Fuller-GLS) on residuals from the German total export series ($dest\_ln\_xt$) and on the first difference from the world income series (Δln_yt).

		Critical values (with constant)		
Variable	**t-Statistic**	**1%**	**5%**	**10%**
$dest\_ln\_xt$	-2.151577	-2.598416	-1.945525**	-1.613760
Δln_yt	-2.509364	-2.598416	-1.945525**	-1.613760
		Critical values (with constant e trend)		
Variable	t-Statistic	1%	5%	10%
$dest\_ln\_xt$	-3.364698	-3.697800	-3.129200**	-2.833000
Δln_yt	-3.274232	-3.694000	-3.126000**	-2.830000

The optimum number of lags chosen for the regressors is evaluated by different selection criteria (Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion (HQC) which, after estimating models with lagged series and in the first difference, they must be compared to choose the one in which the lowest value was estimated by the criteria. It is noteworthy that, as observed by Pesaran *et al.* (2001) the requirement of zero autocorrelation between equation residues may influence the final choice of the optimal number of lags for the model variables. Therefore, based on the alternability of the ARDL models and the criteria for selecting the optimal number of lags, the autocorrelation and stability coefficients of the estimated coefficients, and the sum of the squares of the residuals (SQR) for each equation, the model will assume the following format:

$$dest\_ln\_xt_t = \delta_{0i} + \alpha_1 dest\_ln\_xt_{t-1} + \alpha_2 \Delta ln\_yt_t + \alpha_3 \Delta ln\_yt_{t-1} + \alpha_4 \Delta ln\_yt_{t-2} + \delta_1 ln\_xt_{t-1} + \delta_2 ln\_yt_{t-1} + v_{1t} \quad (3)$$

The Breusch-Godfrey LM test has the same statistical foundations as the LM tests for heteroscedasticity, with the difference of the hypotheses to be tested and the auxiliary regression added to the test where the explanatory variables of the model enter as regressors (Wooldridge, 2006) and, according to the results of Table 8, it is not

possible to reject the hypothesis of null autocorrelation among the residues generated from the Equation 3 estimates, whose estimated coefficients are presented in Table 7.

Table-7. Coefficients for the short-term dynamics of the Equation 3.

Variable	Coefficient	Standard-error	t-Statistic	Prob.
δ_0	-4.551083	1.412010	-3.223124	0.0020
$dest\_ln\_xt_{t-1}$	1.153927	0.123674	9.330399	0.0000
Δln_yt_t	2.439525	0.756947	3.222847	0.0020
Δln_yt_{t-1}	1.195126	0.914425	1.306970	0.1960
Δln_yt_{t-2}	1.142217	0.786491	1.452295	0.1515
ln_xt_{t-1}	-0.570548	0.179678	-3.175386	0.0023
ln_yt_{t-1}	0.660730	0.206500	3.199657	0.0022
R-squared	0.862467	F statistic	64.80016	
Adj. R-squared	0.849157	Prob(F)	0.000000	
RSS	0.043138	Durbin-Watson	1.969884	

Table-8. Breusch-Godfrey LM test for serial correlation of residuals Equation 3.

F statistic	Obs*R-squared	Prob. F(2, 60)	Prob. Chi-squared(2)
2.327759	4.968341	0.1063	0.0834

The Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals, in turn, evaluate the stability of the model. The techniques presented by Brown et al. (1975) were developed to identify stability deviations from the graphical analysis, and the sidebands represent the critical values, calculated at 5% significance. Thus, Figure 4 points to the stability of the estimated model.

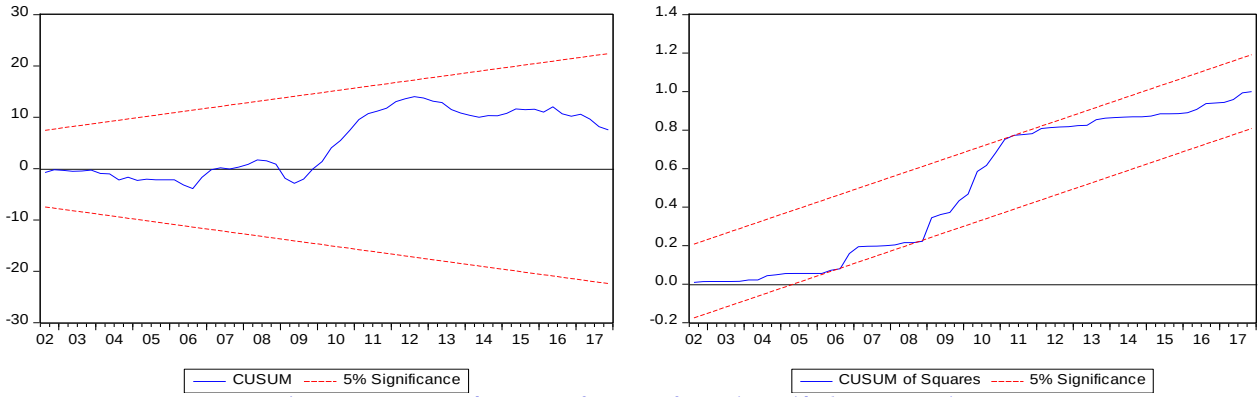

Figure-4. CUSUM and CUSUM of squares of recursive residuals tests Equation 3.

If the stability hypothesis is supported by the CUSUM, but not by CUSUM of Squares, it is assumed that the instability may be due to changes in the variance of the residues rather than to changes in the coefficient values estimated by regression.

4. RESULTS AND DISCUSSION

The bounds test for the cointegration paradigm involves comparing the F statistic against critical values generated for samples and specific lag numbers. As in a conventional cointegration test, the non-rejection of $H0: \theta 1 = \theta 2 = 0$ – in this case, according to Equation 3, δ_1 and $\delta_2 = 0$ – implies the acceptance of the absence of a long-term equilibrium relationship between variables. However, there is a practical difficulty: Exact critical values

are not available for equations that relate variables I(0) and I(1). Thus, Narayan (2005) provides limits to the critical values for the asymptotic distribution of F statistics for various situations (variable numbers and model specification). In each case, the lower bound assumes that all variables are I(0) while the upper bound is based on the assumption that all variables are I(1).

Table-9. ARDL *Bounds* test for cointegration – dependent variable: $dest\_ln\_xt$.

Null hypothesis: there is no long-term relationship		
Statistic test	**Value**	**k**
F statistic	5.132520**	1
Critical values (with constant e with no trend)		
Significance	I(0)	I(1)
1%	5.157	5.957
5%	3.780	4.327
10%	3.120	3.623

*** Statistical significance level of 1%; ** Statistical significance level of 5%; * Statistical significance level of 10%. Critical values were obtained from Narayan (2005) for 70 observations.

For the test carried out with the detrended series of German exports as the dependent variable, the calculated F statistic was 5.132520 Table 9, greater than the limit of more than 5% significance (4.327). This result indicates that the null hypothesis of non-cointegration should not be accepted and, therefore, there is statistical evidence of a long-term relationship between variables xt and yt. If the value obtained for the F statistic were lower than the critical values for I(0), the hypothesis of non-cointegration cannot be rejected and, if the condition $I(0) < F < I(1)$ were true, the test would be inconclusive.

The result of 1.158062 obtained for the long-term multiplier between world income (yt) and German exports (xt) ($-(0.660730/(-0.570548)$, ou $-\delta_2/(\delta_1)$ indicates that on average, a 1% increase in world income increases German exports of goods by approximately 1.16% over the long term. Conversely, a 1% reduction in world income implies a 1.16% reduction in German exports.

According to Thorbecke and Kato (2012) the dynamic ordinary least squares (DOLS) model, suitable for estimating cointegration ratios ensures consistent and efficient estimates for long-term ratio parameters in smaller and smaller samples. Comparatively, the estimator generated by the DOLS indicates that a 1% increase in world income would increase German exports by 1.17% over the long term, a result that reinforces the hypothesis of German exports' sensitivity to international income. From the residuals of the long-term equation with the level variables ($ln\_xt_t = \delta_{0i} + ln\_yt_t + v_{1t}$), Ordinary Least Squares gives the error correction term (ECT) variable, which measures the speed of model adjustment toward long-term equilibrium. The signal obtained for the estimated coefficient is expected to be negative and statistically significant because short-term deviations from long-term equilibrium are allowed, but the adjustment variable will ensure that they are redirected in the opposite direction-. Therefore, the adjusted restricted ECM equation for error correction term analysis will be:

$$detrended\_ln\_xt_t = \delta_{0i} + \alpha_1 detrended\_ln\_xt_{t-1} + \alpha_2 \Delta ln\_yt_t + \alpha_3 \Delta ln\_yt_{t-1} + \alpha_4 \Delta ln\_yt_{t-2} + \alpha_5 ECT_{t-1} + v_{1t} \quad (4)$$

The results presented in Table 10 suggests that approximately 56.82% of deviations from long-term equilibrium are corrected by the model correction term estimated in each period. In the short term, at 5% significance, it is not possible to reject the hypothesis that current world income values have an effect on German

exports: A 1% increase in world income in t implies the growth of German exports by approximately 2.44% in the period. Again, the residual autocorrelation Table 11 and stability Figure 5 tests indicate the validity of the model.

Table-10. Coefficients for the short-term dynamics of the Equation 4.

Variable	Coefficient	Standard-error	t-Statistic	Prob.
δ_0	-0.046343	0.0077129	-6.500486	0.0000
$detrended\_ln\_xt_{t-1}$	1.151773	0.119972	9.600346	0.0000
Δln_yt_t	2.441078	0.750729	3.251611	0.0018
Δln_yt_{t-1}	1.193819	0.907055	1.316149	0.1929
Δln_yt_{t-2}	1.150846	0.773437	1.487963	0.1417
ECT_{t-1}	-0.568176	0.175994	-3.228378	0.0020
R-squared	0.862452	F statistic	79.00418	
Adj. R-squared	0.851535	Prob(F)	0.000000	
RSS	0.043143	Durbin-Watson	1,970376	

Table-11. Breusch-Godfrey LM test for serial correlation of residuals Equation 4.

F statistic	Obs*R-squared	Prob. F(1, 64)	Prob. Chi-squared(1)
2.313334	4.864487	0.1075	0.0878

For the period 2000–2017, it is possible to corroborate the hypothesis of elasticity of German exports in response to fluctuations in world income. In the short term, the amount exported responds substantially to changes in income: A 1% increase in world income results in an average growth of 2.44% in German exports; in the long run, although less elastic, exports tend to increase by 1.16% in response to a 1% change in international income.

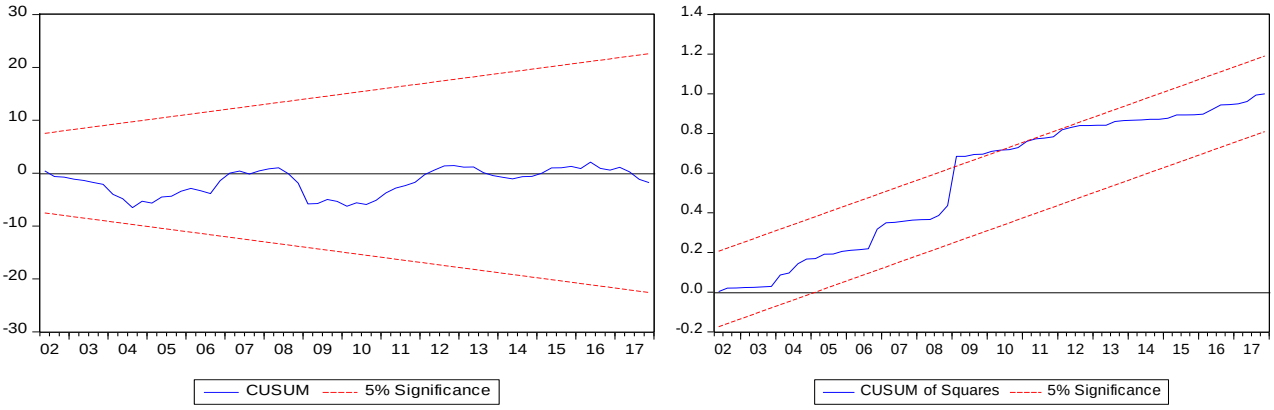

Figure-5. CUSUM and CUSUM of squares of recursive residuals tests Equation 4.

Additionally, since there is statistical evidence of a long-term relationship between the variables and therefore of cointegration, it is possible to state, in accordance with the literature, that German exports and thus its economic growth are structurally dependent on external demand and increasingly betting on this market to support manufacturing production and this sector's income (Bernard and Wagner, 1997; EC, 2010; Kundnani, 2015; Baccaro and Benassi, 2017). Perhaps most importantly, the country's economy seems to show signs of weakness because it is so dependent on external demand and therefore more vulnerable to external shocks (Beck and Scherrer, 2010; Thorbecke and Kato, 2012; Kundnani, 2015).

5. FINAL CONSIDERATIONS

German economic growth became substantially dependent on the country's exports, and the remarkable growth of manufactured and technologically competitive goods production to other markets was responsible for the German economic resurgence from a "sick man of Europe" to an "economic superstar."

From the second half of the 2000s onwards, unemployment began to drop from its peak of 4.8 million (2005) to 3.2 million in 2008, a fall of 33.3%, and after just over 15 years since the creation of the euro (1999), Germany stands out as the most powerful and influential economy in Europe and will remain so as long as its strategies are met and reinforced by the European institutions. However, at the same time, the domestic economy underperformed, notably in relation to consumption and private investment, at the expense of successive expansions in the German trade balance, especially from the early 2000s. Those are closely related issues that must be analyzed from a broader, necessarily more complex perspective in reference to the reunification period in 1990.

The diagnostic, cause-and-effect analysis of the economy and society in the context of a country's economic sovereignty strengthening seems precise for two distinct theoretical lines that diverge in the interpretation of the means and implementations of economic policies concerning the issues and problems identified for the German reality. In the first case, (I) the restructuring of the governance structure and industrial relations, (II) the greater economic liberalization and the flexibility of growth in the labor market and (III) the restriction of the welfare state's scope since the Hartz reforms - and, as a consequence, reductions or maintenance of wage levels that allowed the unconditional shrinkage of unit labor costs - would have been the identified measures as a response, in the last instance, to the intensification of the processes of productive globalization and international competition, which resulted in an increased labor productivity and, once pointed to as a driver of economic growth, of the country's exports. Beforehand, according to the diagnosis of the problem situation – intensification of trade flows and increased international competition – the credits to the increase in productivity and German net exports for the second line of thinking (the second case) assessed are due to technological superiority and high competitiveness gains through non-price mechanisms (Streeck and Trampusch, 2005; Beck and Scherrer, 2010; Storm and Naastepad, 2015). Moreover, while for the first line of thinking the shrinkage of unit labor costs was perceived as absolute and as a consequence of wage squeezes, for the second line of thinking the increase in productivity is the coefficient that surely stands out as a determinant factor for the reduction in relative unit labor costs. Both fronts understand the processes of social and income inequalities deepening and growing the dualization of the German economy, where a coordinated, institutionally strengthened and protected sectoral core (manufacturing) benefits at the expense of, and as a necessary condition of, a less regulated, socially supported and more flexible sector (service sector). The wage decline in the latter is a reflection and part of a historical process of economic policy choices and definitions that have weakened domestic demand but have given strength to and explain the increasing dependence of the German economy on its exports. Thus, some lessons can be learned. The first concerns a possible weakness of a growth model that relies heavily on exports as a source of demand. Between 2000 and 2017, in both shorter- and longer-term horizons, German exports were elastic to fluctuations in world income. It is a possible weakness because, as mentioned earlier, there is in this behavior a close connection with Ostpolitik which, by focusing on the need to mitigate the tensions that still marked the Cold War, underpinned an economy that was developing in an environment of integration and which, therefore presented conditions for German export-based economic growth. The changes observed in world reality in a more recent period could put such a model into doubt. The second lesson points to the fact that the high productivity gains that acted as drivers of the manufacturing sector, where there are strong incentives for technology and international exposure, came at the expense of a lesser supported political and social "sector" capable of restoring internal imbalances. Last but not least are the reflections that credit market coordination mechanisms are valid, not so much in the policies of economic liberalization and fiscal austerity that greatly cause the reduction in unit labor costs, but as the main factor that can explain the German economic rebound. Through the combination of historical and econometric analyses, the proposal of a hypothesis test and

economic questioning, which were feasible during the study, and the achievement of the research objectives, the practical applicability and and adherence to the reality of the chosen problem theme is then pronounced. The work contemplated a historical, economic and social analysis, which can help in the analysis and understanding of the process of recovery of the German economy through the growth of its exports. It is worth noting, however, that there are still important issues to be explored, such as a more detailed investigation of the main determinants of German exports or the trade balance, which constitutes a limitation of the research. Moreover, the attempt to expose and demonstrate the ordering of the international political arrangements that strengthened and led to the formation of the European Union, and thus to the deepening of integration and economic relations on the continent, could, finally, serve as further support for clarification in relation to the conception of a civilian power. Given the relevance of the mentioned aspects, such questions are included in the possibilities of future research agendas.

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