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The International Business Environments of Franchising in BRICS Economies

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ABSTRACT

This article aims to analyze the factors that explain the growth and success of the franchising in BRICS economies, and study the long-term relationship between determinants and impacts of franchising in these economies. We propose a panel data regression model for determining the factors affecting the franchising market in BRICS economies. The model is designed for the time period of 2000-2019. We use a Granger causality to study the long-term relationship between determinants and impacts of franchising. The Results suggests that the development of franchising in BRICS economies is determinated by economic, social, political and legal factors. On the one hand GDP per capita and degree of International competitiveness has a positive impact on franchise, so the purchasing power and the level of individual income affect franchising investment. On the other hand, the market size and level of urbanization have an important impact on franchising investment. Although, there is evidence of interactions between determinants and impacts of franchising in BRICS economies.

Keywords: Franchising, Emerging Markets, Employment Contribution, Domestic investment

INTRODUCTION

The Franchising consists of a system where by a franchisor concedes to a franchisee, through a franchise agreement: the right to use a trademark or a patent, the right of exclusive or semi-exclusive distribution of products or services; and the right to use deployment technology and business administration or operating system developed or held by the franchisor. This concession involves direct or indirect remuneration, without, however, being characterized by a working relationship between franchisor and franchisee [1].

Franchising is one of the current great business success stories; it is the most complete form of the associated trade. This business format provides the conditions to promote the business sector, encourage the expansion of the activities of a company and ensure the improvement of the quality / price of goods and services for consumers.

It general, there are two main factors that explain the growth of franchising in emerging countries: the saturation of developed markets and search for new markets, and the liberalization of emerging economies and improvement of their business environment [2]. Thus, emerging markets are a favorable context for the development of the franchise, because they meet the conditions for the success of this business format. Alon (2001) [3], Singh (2010) [4] indicates that the franchise investment in emerging markets offer many opportunities for

foreign investors by enabling international expansion of their activities and realizing significant profits, while the domestic market access to new sources of economic growth, create job and transfer the skills and technology.

In addition, emerging markets present several opportunities for international franchising, but the economic potential varies according to the characteristics of each market. Alon (2006) [5] examines how service franchises can assess the size of the market service sector; he compared the size of emerging markets for service franchises based on World Bank information for 20 emerging markets. It showed that China and India are not necessarily the most promising markets, so, they have a large market, as well as Brazil, Russia and Mexico are considered the most markets attractive for service franchises, and beyond China and India in terms of attractiveness of franchise service. Emerging markets comprise the most important and dynamic markets for international franchisors, given their population, income per capita, rates of urbanization, and income distribution. Per capita income is significantly and positively correlated with the number of international franchisors in a host country (Alon, 2006) [6].

The importance of franchise industry encourages host countries to adopt several strategies to promote this sector. In the Asian zone, specific instruments are adopted to facilitate the entry of foreign franchisors: the relaxation of laws on foreign property as in the case of Indonesia, and the adoption of international standards of protection of intellectual property as the case of China [7].

Although, in this study, we aim to examine the factors that determine the success of the franchising in BRICS markets, and study the long-term relationship between the determinants and impacts of franchising in these economies.

EVOLUTION OF FRANCHISE MARKET IN BRICS ECONOMIES

The franchise sector in the BRICS countries experienced accelerated and continuous growth between 2000 and 2019, with an advantage for China, followed by India. Also, this growth is the result of the increase in the number of franchise networks and number of franchise outlets, which almost doubled from 2009 to 2019.

The importance of franchise market is manifested by the turnover, the contribution to the national GDP and the direct employment created by this sector.

Table 1. Evolution of franchise market in BRICS from 2000 to 2019

	China			India			Brazil		
	2000	2010	2019	2000	2010	2019	2000	2010	2019
NBR_SYSTM	450	4 200	4 500	476	1 900	4 600	894	1 855	2 918
NBRE_OUTLETS_FR	50 000	365 000	400 000	27 600	100 000	200 000	46 534	86 365	160 958
NBR_JOBS	700 000	3 000 000	4 000 000	200 000	400 000	1 500 000	226 334	777 285	1 350 000
CONT_GDP	6,0%	8,9%	6,6%	-	0,7%	1.8%	1,5%	2,1%	3,0%
REVENU-FR (miliard USD)	20 000	-	47 800	1 100	7 500	51 000	2 281	14 345	46 300
DOMESTIC-BRANDS %	70%	-	90%	25%	25%	25%	80%	93%	93%
FOREIGN-BRANDS %	30%		10%	75%	75%	75%	20%	7%	7%
FR_LAWS	0	1	1	0	0	0	0	1	1

	Russian Federation			South Africa		
	2000	2010	2019	2000	2010	2019
NBR_SYSTM	110	550	2 250	265	540	813
NBRE_OUTLETS_FR	10 000	30 000	100 000	19 800	28 520	47 923
NBR_JOBS	90 000	300 000	1 400 000	150 000	-	500 000
CONT_GDP	3,5%	4,3%	3,5%	8,4%	-	13,9%
REVENU-FR (miliard USD)	1 500	3 850	2 800	-	19 390	49 470
DOMESTIC-BRANDS %	70%	70%	65%	-	89%	73%
FOREIGN-BRANDS %	30%	30%	35%	-	11%	27%
FR_LAWS	1	1	1	0	1	1

Source: author

Franchising in China

In 2009, the franchise industry in China experienced rapid development, the number of franchise systems crossed the threshold of 4,000, up nearly 15% from 2008. The total number of franchised stores increased exceeded 330,000, and each franchise system had on average of 83 franchise stores according to China Franchise Market Report (2011) [8]. According to the China Chain Store & Franchise Association (CCFA), as of 2019, China has more than 4,500 franchises and chains with more than 400,000 operating outlets, making China one of the largest franchise markets in the world [9].

China adopted the first franchise law in 1997, but foreign franchising remained primarily a gray area during this period until a new law was announced in 2005 that removed legal restrictions

on foreign investment in franchise. Franchise relationships are governed by the following regulations and administrative measures in China [10].

Franchising in India

India is the second largest franchise market in the world after the United States of America (USA) with approximately 4,600 active franchisors and 0.15 to 0.17 million franchised outlets in 2017. The industry is expected to contribute around 4% of India's GDP by 2022. Franchising is not only a great way to encourage self-employment, but also a huge generator of job. The franchise industry is estimated to employ over 14 million people, or nearly 10% of the total estimated Indian workforce [11].

In India, there are no specific laws governing franchising, the franchise agreement is governed by several different laws and regulations [12].

Franchising in Brazil

Franchising industry in Brazil has grown considerably more than the retail industry and even more than the Gross Domestic Product [13]. In 2019, the number of franchise networks and franchise units in Brazil increased, reaching around 160958 units and 2918 franchise networks, according to Brazilian franchise association.

Brazil has a specific law that regulates the franchising sector, contributing to a coherent legal system for national and international partners [14].

Franchising in Russian Federation

In the first four years of using the franchise business model (from 1995 to 1999), 42 franchise companies appeared in Russia, that is, around 10 new franchises per year. In 2018, their number was multiplied by more than 50 times [15], this is equivalent to more than 2150 franchise brands and more than 2600 franchise brands in 2020 [16].

The turnover of the franchise market in Russia occupies a significant share in the country's GDP, for 2017 it amounted to more than 3.5% [17]. It is worth noting that franchises in Russia occupied 62% of the national franchise market in 2017 and about 65% in 2019. Thus, the Russian franchise market is dominated by domestic brands, but the average of foreign-brands is estimated at 35% in 2019.

Franchising in South Africa

However, in South Africa, the franchise market experienced accelerated and continuous growth between 2000 and 2019. The number of franchises system increased from 265 franchises in 2000 to 813 franchises in 2019, with more than 47 923 franchise outlets.

Franchising is an important source of jobs and economic output in South Africa, so the contribution to GDP increased from 8.4 % in 2000 to 13,9% in 2019 [18] , is equivalent to R734 billion of total South African GDP in 2019.

The total number of people employed in franchise systems in South Africa is estimated at 370000 (369 573 in 2018). The average number of employees per system is 427 [19].

The number of international brands in South Africa has more than doubled between 2017 and 2018, from 12% to 27% [20]. Thus, the franchise market is dominated by the domestic brands, with an estimated average of 73% in 2018.

EMPIRICAL STUDY

Determinants of franchising in BRICS

The model

To analysis the factors of success of franchising in BRICS countries, we specify an econometric model. Consider the following regression equation:

$$\boldsymbol{FR_{i,t} = \alpha_{i,t} + \beta_{i,t} ECO_{i,t} + \gamma_{i,t} DEM_{i,t} + \delta_{i,t} POL_{i,t} + \eta_{i,t} LEG_{i,t} + \varepsilon_{i,t}}\ .$$

Where i = 1,2,…,N are cross-section units and t = 1,2,…,T the observed periods, **FR** is a dependent variable. **ECO, DEM, POL** and **LEG** are the independent variables, $\boldsymbol{\varepsilon_{i,t}}$ is a error term, $\boldsymbol{\alpha_{i,t}}$ is a constant, and **β**; **γ**; **δ**; **η**; are the parameters.

In this study, we use panel data regression model for determining the factors affecting the franchising market in BRICS economies. The model is designed for the time period of 2000-2019. The number of franchise outlets is used as dependent variable and the independent variables are presented in table 1.

However, to analysis the economic factors, GDP growth rate is used as an indicator of economic potential of cross countries, GDP per capita is used to indicated the purchasing power and the level of individual income. So to measure the Economic instability, inflation rate is used. Degree of International competitiveness is represented by International competitiveness index. To analysis the demographic and social factors, population is used as an indicator of market size. Urban population and Human Development Index are used as indicator of degree of country's urbanization. Labor force is used to measure the contribution of female entrepreneurs in franchise growth.

About the political factors, Corruption Perceptions Index is used as an indicator of degree of government corruption. Finally, the variable specific franchise laws is used to indicate the existence of specific legal Framework for Franchising.

Table 2. Description of model variables

Variables	Signe	Indicator	Signe
Dependent variable	**FR**	Number of franchise outlets	**FR**
Economic variable	ECO	GDP growth rate (%)	GDR_RAT
		GDP per capita	GDR
		Inflation rate	INF_RAT
		International competitiveness index	COMP_INT
Demographic variable	DEM	Population	POP
		Urban population (% of total population)	URB_POP
		Human Development Index	DEV_HUM
		Labor force, female (% of total labor force)	LABOR_FEM
Political variable	POL	CORRUPTION PERCEPTIONS INDEX	CORRUP_INDEX
		Economic Freedom Index	ECO_FREE
		Global Political Rights Index	POL_FREE
Legal variable	LEG	Specific franchise laws	FR_LAWS

Source: author

CORRELATION RESULTS

The results of the correlations analysis indicate a strong positive relationship between the variables number of franchise outlets and size of population (coefficient =0.67), and International competitiveness (coefficient =0.5).Also, there is a negative correlation between the variables number of franchise outlets and inflation rate (coefficient = -0.41).

Table 3. Correlation results

	NBRE_OUTLETS_FR
NBRE_OUTLETS_FR	1
GDR	0,064497
GDR_RAT	0,345777
INF_RAT	-0,410427
COMP_INT	0,500078
POP	0,675872
URB_POP	-0,200931
LABOR_FEM	0,195355
DEV_HUM	-0,064513
CORRUP_INDEX	0,089413
ECO_FREE	-0,133192
POL_FREE	0,453336
FR_LAWS	0,136892

Source: Author

Specification test

The specification test makes it possible to verify whether the model is identical for all crossed countries, or on the contrary if there are specificities specific to each country. The Breusch-Pagan Lagrange Multiplier test is performed to choose between the pooled OLS and the random effects. The Breusch-Pagan Lagrange Multiplier test for random effects results (Table 4) accepts the null hypothesis that the Pooled OLS model was appropriate.

Table 4. Breusch-Pagan Lagrange Multiplier test results

	Cross- section	Time	Both
Breusch-Pagan	0.638132 (0.4244)	3.089440 (0.0788)	3.727571 (0.0535)

Source: Author

Estimation results

The results of the OLS estimation show that the model is globally significant (R^2 = 0.9 is close to 1, f-statistic =0.0000 is less than 5%) and the results of the estimates show that variables GRD,COMP_INT, POP, URB_POP, CORRUP_INDEX and FR_LAWS have positive and statistically significant effects on franchise (F-statistic is less than 5%). These results therefore suggest that these variables have a positive impact on franchise. Table (5) shows the results of the OLS estimation.

Table 5. Results of the OLS estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDR	5.622709	1.757151	3.199902	0.0019
GDR_RAT	993.7168	1434.433	0.692759	0.4903
INF_RAT	1255.597	1323.434	0.948742	0.3454
COMP_INT	13722.12	6373.146	2.153115	0.0341
POP	0.000231	1.50E-05	15.44131	0.0000
URB_POP	2552.111	665.2521	3.836307	0.0002
LABOR_FEM	-360.3540	654.8354	-0.550297	0.5835
DEV_HUM	8730.579	6573.451	1.328158	0.1876
CORRUP_INDEX	4565.029	702.6448	6.496922	0.0000
ECO_FREE	-2623.393	7795.125	-0.336543	0.7373
POL_FREE	6108.893	5588.598	1.093099	0.2774
FR_LAWS	56893.70	14736.19	3.860816	0.0002
C	-481040.2	70292.37	-6.843420	0.0000

R-squared	0.902864	Mean dependent var	103901.7
Adjusted R-squared	0.889466	S.D. dependent var	104888.7
S.E. of regression	34871.99	Akaike info criterion	23.87749
Sum squared resid	1.06E+11	Schwarz criterion	24.21617
Log likelihood	-1180.875	Hannan-Quinn criter.	24.01456
F-statistic	67.38769	Durbin-Watson stat	0.488181
Prob(F-statistic)	0.000000		

Source: author

The Results obtained suggests that the development of franchising in BRICS economies is determinate by economic, social, political and legal factors. On the one hand GDP per capita and degree of International competitiveness have a positive impact on franchise, so the purchasing power and the level of individual income affect the franchising investment. But the economic instability presented by inflation rate has no impact on franchise.

Although, the size of the population and the size of urban population are the main social determinants, the size of the market and the level of urbanization have an important impact on franchise investment. However, the Human Development Index and the female workforce show no impact. In addition, the levels of public sector corruption affect investment in franchising, but the Economic Freedom Index and the Global Political Rights Index show no impact. The

existence of specific legal Framework for Franchising is an important factor affecting the franchising market in BRICS economies.

Granger causality between determinants and impacts of franchising in BRICS

To examine the long-term relationship between determinants and the impacts of franchising, the empirical analysis follows these steps: the series are tested for stationarity by unit root tests, and the long run cointegration relationship between the variables is tested by Kao and Pedroni tests. In the last step the Granger causality is investigated.

The panel cointegration test and Granger Causality methods were used to examine the relationship between determinants and impacts of franchise in BRICS markets. The impacts of franchise are presented by four variables, number of employees created by franchise is used to indicate contribution of the employment, the contribution to GDP is measured by turnover of the franchise. Number of domestic brandsis used as an indicator of domestic investment and Number of foreign brands is used as an indicator of Economic modernization (Table 6).
Consider the following equations:

$$\mathbf{GDR} = \boldsymbol{f}(\ \mathbf{C_JOBS}\ , \mathbf{C_REVENUS}\ \ , \mathbf{C_INVEST}\ , \mathbf{ECO_MOD}\ )$$

Equation 1: examine the long-term causal relationship between **GDP** and the impacts of franchising

$$\mathbf{COMP_INT} = \boldsymbol{f}(\ \mathbf{C_JOBS}\ , \mathbf{C_REVENUS}\ \ , \mathbf{C_INVEST}\ , \mathbf{ECO_MOD}\ )$$

Equation 2: examine the causal relationship between **COMP_INT** and the impacts of franchising

$$\mathbf{LABOR_FEM} = \boldsymbol{f}(\ \mathbf{C_JOBS}\ , \mathbf{C_REVENUS}\ \ , \mathbf{C_INVEST}\ , \mathbf{ECO_MOD}\ )$$

Equation 3: examine the causal relationship between **LABOR_FEM** and the impacts of franchising

$$\mathbf{FR_LAWS} = \boldsymbol{f}(\ \mathbf{C_JOBS}\ , \mathbf{C_REVENUS}\ \ , \mathbf{C_INVEST}\ , \mathbf{ECO_MOD}\ )$$

Equation 4: examine the causal relationship between **FR_LAWS** and the impacts of franchising

Table 61 : Endogenous variables

Variables	Signe	Indicator
Employment Contribution	**C_JOBS**	Number of employees
Contribution to GDP	**C_REVENUS**	Franchising turnover
Domestic investment	**C_INVEST**	Number of domestic brands
Economic modernization	**ECO_MOD**	Number of foreign brands

Source: author

Panel Unit Root Test results

All the tests (Levin, Lin and Chu; Im, Pesaran and Shin; ADF – Fisher Chi square and PP – Fisher Chi square) reject the null hypothesis of unit root for the first differences. Based on these results we conclude that the non-stationarity of the panel is probable, therefore we treat the variables as integrated of order one I(1) (Appendix 5).

Panel Cointegration Test results

A long-term relationship between no stationary variables can only exist if the variables are cointegrated. Thus, the cointegration relationship between the variables is tested by Kao and Pedroni tests.

Kao panel Cointégration Test

The results indicate that the null hypothesis of no-cointegration is rejected by the Kao test, for equation 1 and equation 3, therefore we accept the cointegration relation between the variables. However, the null hypothesis is accepted for equation 2 and equation 4 (Appendix 6).

Table 7. Kao residual Cointegration

ADF	Equation 1	Equation 2	Equation 3	Equation 4
t-Statistic	-1,89323	-0,91113	-3,028754	-1,129436
Prob	0,0292	0,1811	0,0012	0,1294

Source: author

Pedroni panel cointegration tests

Equation 1: The results of the Pedroni test indicate that test statistic within « Panel v-statistic» ($p<0.05$) and test statistics between «Group PP-statistic» ($p=0.002$) reject the null hypothesis of no-cointegration and accept the cointegration relation.

Equation 3: Based on the results of test statistic within «Panel ADF-statistic», and tests statistics between «Group PP-statistic» and « Group ADF-statistic » the null hypothesis of no-cointegration is strongly rejected. The variables are therefore cointegrated.

Equation 2 and equation 4: The Pedroni tests indicate that the variables are not cointegrated.

Table 8. Pedroni residual cointegration

	Equation 1		**Equation 2**		**Equation 3**		**Equation 4**	
	t-Statistic	**Prob**	**t-Statistic**	**Prob**	**t-Statistic**	**Prob**	**t-Statistic**	**Prob**
Panel v-statistic	**1,930185**	**0,0268**	**0,215904**	**0,4145**	**-2,098415**	**0,9821**	**-0,258184**	**0,6019**
Panel rho-statistic	**1,011177**	**0,8440**	**1,029437**	**0,8484**	**1,448585**	**0,9263**	**0,706402**	**0,7600**
Panel PP-statistic	**-1,591313**	**0,0558**	**-0,989429**	**0,1612**	**-1,23253**	**0,1089**	**-0,805929**	**0,2101**
Panel ADF-statistic	**-1,525201**	**0,0636**	**-0,650491**	**0,2577**	**-5,704779**	**0,0000**	**-0,862679**	**0,1942**
Group rho-statistic	**1,998896**	**0,9972**	**1,829334**	**0,9663**	**1,910947**	**0,9720**	**0,251748**	**0,8947**
Group PP-statistic	**-3,510304**	**0,0002**	**-1,316188**	**0,0941**	**-4,203802**	**0,0000**	**-0,527385**	**0,2990**
Group ADF-statistic	**-1,517328**	**0,0646**	**-0,444158**	**0,3285**	**-4,933219**	**0,0000**	**-0,582692**	**0,2801**

Source : author

Granger Causality Test

In time series analysis, we want to know whether changes in one of the variables will influence changes in the other variable and identify the direction of the causality (unidirectional, bidirectional, none).

Equation 1: The results of the Granger causality test indicate that there is an unidirectional relationship between the variables FORIENG_BRANDS and NBR_JOBS (p=0.0001), DOMESTIC_BRANDS and NBR_JOBS (p=0.0013). These results confirm that domestic and foreign brands contribute to job creation.

Also the Granger causality test show the absence of a long-term relationship between the GDR and the variables C_JOBS, C_REVENUS, C_INVEST, ECO_MOD (p-value is greater than 0.05 for all variables), which indicates the absence of long-term interactions between GDP and the impact of franchising.

Equation 2: Granger Causality results indicate the absence of a long-term relationship between the COMP_INT and the variables C_JOBS, C_REVENUS, C_INVEST, ECO_MOD (p-value is greater than 0.05 for all variables).

Equation 3: Granger Causality results indicate that there is an unidirectional relationship between the variables REVENU_FR and LABOR_FEM (p=0.0291), which indicates the turnover generated by the franchise market attracts more women to invest in franchises.

Equation 4 : The results of Granger causality indicate that there is an unidirectional relationship between the variables NBR_JOBS and FR_LAWS (p=0.0263). This result is explained by the importance of the contribution to employment of franchise systems encouraging the governments of the countries to adopt a specific franchise law. Whose objective is to regulate this sector and protect the interests of franchise stakeholders.

Granger Causality results indicate that there is an unidirectional relationship between the variables FR_LAWS et DOMESTIC_BRANDS (p=0.0480). This result is explained by the adoption of specific law of franchising encourages local companies to franchise their brands and increase the number of outlets; therefore, the legal framework encourages domestic investment.

Table 9. Granger Causality Test

	t-Statistic	Prob
FORIENG_BRANDS cause NBR_JOBS	10,24440	0,0001
DOMESTIC_BRANDS cause NBR_JOBS	7,24863	0,0013
REVENU_FR et LABOR_FEM	3,69640	0,0291
NBR_JOBS et FR_LAWS	3,80890	0,0263
FR_LAWS et DOMESTIC_BRANDS	3,15584	0,0480

Source: author

RESULTS AND CONCLUSIONS

In this article, the relationship between the determinants and the impacts of franchising in the BRICS economies has been studied. First, the results indicate that the success of franchising in the BRICS economies is determinated in particular by the level of GDP per capita as franchises

provide the consumer with international quality products the purchasing power and the level of individual income is very important. The degree of international competitiveness measures the capacity of a country to create the conditions necessary to revive long-term growth and prosperity, to encourage innovation, to improve labor, financial and human capital markets.

Also, this variable has a positive and significant impact on the franchise .Although the size of the population and the size of the urban population are the main social determinants, the size of the market and the level of urbanization therefore have a significant impact on franchise investment. Moreover, the levels of public sector corruption affect investment in franchising, The existence of specific legal Framework for Franchising is an important factor affecting the franchising market in BRICS economies.

The results also show that the franchise contributes significantly to GDP of BRICS economies, and it encourage domestic investment and contributes to job creation, and economic modernization.

According to the results, there is evidence of interactions between determinants and impacts of franchising in BRICS economies, in particular between the existence of a specific legal framework and the determinants of franchising, also, the existence of a specific legal framework for franchising is a very important factor which encourages domestic investment, because a stable and transparent regulatory environment is essential for the success of franchising agreement. The results indicate that the forieng_brands and the domestic_brands of franchising contribute significatifly to job creation, (Figure 1 resume the results of research).

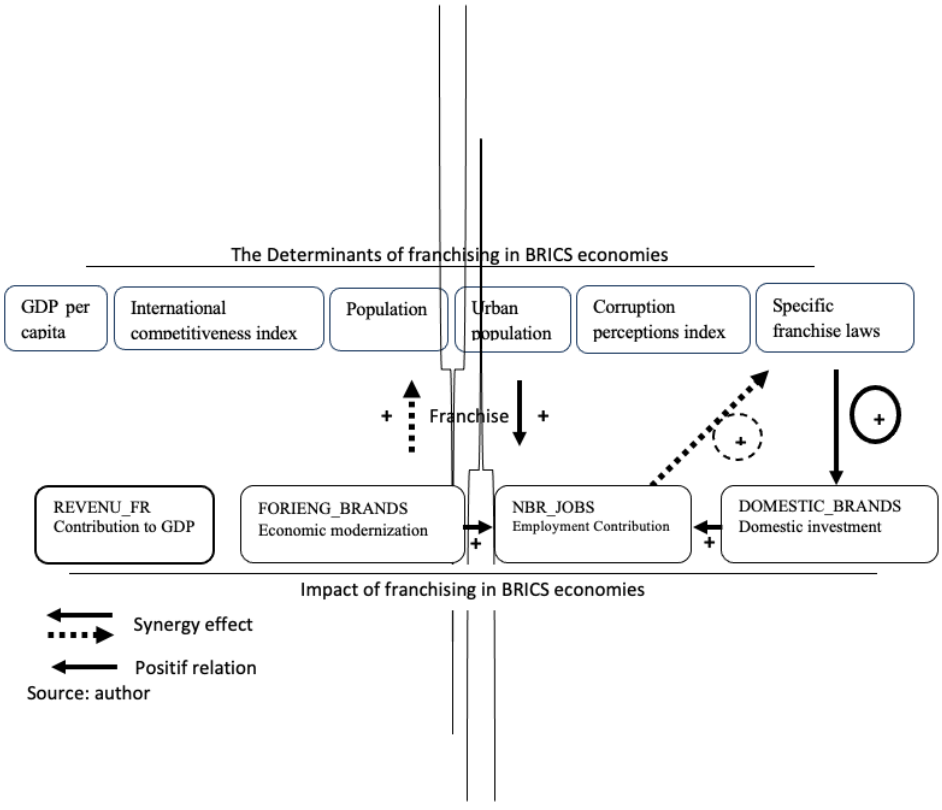


Figure 1. Results
Source: author

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APPENDIX 1.CORRELATION

	NBRE_OUT...	GDR_RAT	GDR	INF_RAT	COMP_INT	POP	URB_POP	LABOR_FEM	DEV_HUM	ECO_FREE	POL_FREE	CORRUP_I...	FR_LAWS
NBRE...	1	0.34577658...	0.06449706...	-0.4104274...	0.50007801...	0.67587222...	-0.2009313...	0.19535486...	-0.0645127...	-0.1331924...	0.45333617...	0.08941293...	0.13689190...
GDR_...	0.34577658...	1	-0.4940916...	-0.2006796...	-0.0763989...	0.65857581...	-0.5618073...	0.02239015...	-0.1064482...	-0.0601087...	0.42199212...	-0.1867232...	-0.3885358...
GDR	0.06449706...	-0.4940916...	1	-0.0397903...	0.30952190...	-0.5069879...	0.71946742...	0.45211550...	0.02619469...	-0.0181925...	0.04150928...	-0.0807418...	0.70674592...
INF_RAT	-0.4104274...	-0.2006796...	-0.0397903...	1	-0.3735099...	-0.3798226...	0.26175851...	-0.0702656...	0.01066041...	-0.2537637...	-0.0683990...	-0.3189023...	0.19181940...
COMP_...	0.50007801...	-0.0763989...	0.30952190...	-0.3735099...	1	0.21671140...	-0.0438144...	-0.0099963...	0.00560582...	0.12151594...	0.15474575...	0.18905596...	0.11502545...
POP	0.67587222...	0.65857581...	-0.5069879...	-0.3798226...	0.21671140...	1	-0.7901949...	-0.2031429...	-0.1594479...	-0.0892499...	0.44827913...	-0.1340307...	-0.4826359...
URB_...	-0.2009313...	-0.5618073...	0.71946742...	0.26175851...	-0.0438144...	-0.7901949...	1	0.56707318...	0.10552906...	-0.1502305...	-0.1489762...	0.02284803...	0.79557029...
LABOR...	0.19535486...	0.02239015...	0.45211550...	-0.0702656...	-0.0099963...	-0.2031429...	0.56707318...	1	0.08647804...	-0.2683209...	0.57912900...	-0.2219168...	0.59120429...
DEV_...	-0.0645127...	-0.1064482...	0.02619469...	0.01066041...	0.00560582...	-0.1594479...	0.10552906...	0.08647804...	1	0.07808203...	-0.0459151...	0.15706729...	-0.0250375...
ECO_...	-0.1331924...	-0.0601087...	-0.0181925...	-0.2537637...	0.12151594...	-0.0892499...	-0.1502305...	-0.2683209...	0.07808203...	1	-0.2882187...	0.40318407...	-0.2110477...
POL_F...	0.45333617...	0.42199212...	0.04150928...	-0.0683990...	0.15474575...	0.44827913...	-0.1489762...	0.57912900...	-0.0459151...	-0.2882187...	1	-0.5389541...	0.14646116...
CORR...	0.08941293...	-0.1867232...	-0.0807418...	-0.3189023...	0.18905596...	-0.1340307...	0.02284803...	-0.2219168...	0.15706729...	0.40318407...	-0.5389541...	1	-0.1020817...
FR_LAWS	0.13689190...	-0.3885358...	0.70674592...	0.19181940...	0.11502545...	-0.4826359...	0.79557029...	0.59120429...	-0.0250375...	-0.2110477...	0.14646116...	-0.1020817...	1

APPENDIX 2. TESTE BREUSCH-PAGAN

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	0.638132 (0.4244)	3.089440 (0.0788)	3.727571 (0.0535)
Honda	-0.798831 (0.7878)	-1.757680 (0.9606)	-1.807727 (0.9647)
King-Wu	-0.798831 (0.7878)	-1.757680 (0.9606)	-1.459056 (0.9277)
Standardized Honda	11.88746 (0.0000)	-1.412667 (0.9211)	-5.938612 (1.0000)
Standardized King-Wu	11.88746 (0.0000)	-1.412667 (0.9211)	-6.934545 (1.0000)
Gourieroux, et al.	--	--	0.000000 (1.0000)

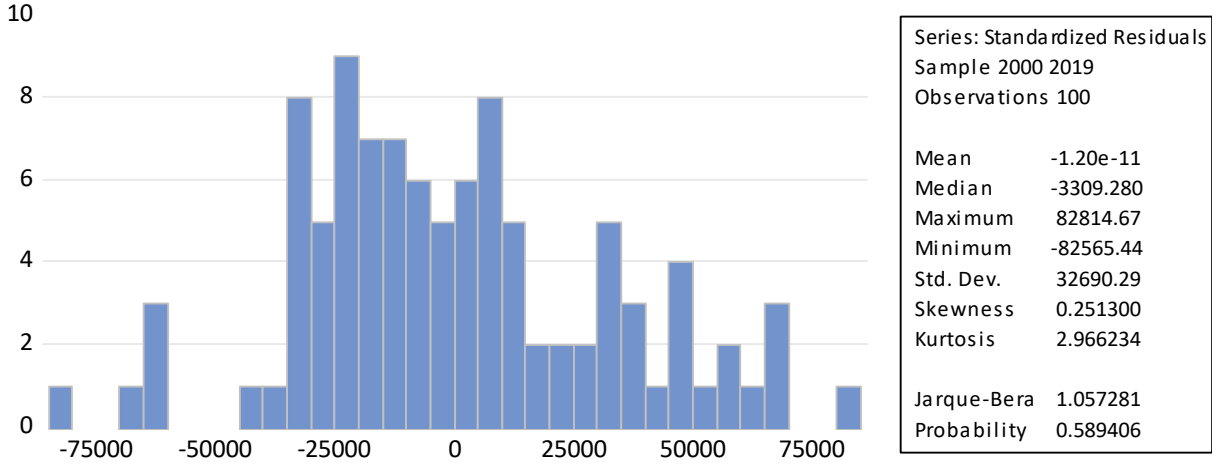
APPENDIX 3. RESULTS OF THE OLS ESTIMATION

Dependent Variable: NBRE_OUTLETS_FR
Method: Panel Least Squares
Date: 10/22/21 Time: 20:04
Sample: 2000 2019
Periods included: 20
Cross-sections included: 5
Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDR	5.622709	1.757151	3.199902	0.0019
GDR_RAT	993.7168	1434.433	0.692759	0.4903
INF_RAT	1255.597	1323.434	0.948742	0.3454
COMP_INT	13722.12	6373.146	2.153115	0.0341
POP	0.000231	1.50E-05	15.44131	0.0000
URB_POP	2552.111	665.2521	3.836307	0.0002
LABOR_FEM	-360.3540	654.8354	-0.550297	0.5835
DEV_HUM	8730.579	6573.451	1.328158	0.1876
CORRUP_INDEX	4565.029	702.6448	6.496922	0.0000
ECO_FREE	-2623.393	7795.125	-0.336543	0.7373
POL_FREE	6108.893	5588.598	1.093099	0.2774
FR_LAWS	56893.70	14736.19	3.860816	0.0002
C	-481040.2	70292.37	-6.843420	0.0000

R-squared	0.902864	Mean dependent var	103901.7
Adjusted R-squared	0.889466	S.D. dependent var	104888.7
S.E. of regression	34871.99	Akaike info criterion	23.87749
Sum squared resid	1.06E+11	Schwarz criterion	24.21617
Log likelihood	-1180.875	Hannan-Quinn criter.	24.01456
F-statistic	67.38769	Durbin-Watson stat	0.488181
Prob(F-statistic)	0.000000		

APPENDIX 4. RESIDUALS NORMALITY TEST



APPENDIX 5. PANEL UNIT ROOT TEST RESULTS

Level

Panel unit root test: Summary
Series: NBR_JOBS
Date: 09/28/21 Time: 17:27
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.65228	0.7429	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	3.62260	0.9999	5	90
ADF - Fisher Chi-square	1.87053	0.9972	5	90
PP - Fisher Chi-square	5.92430	0.8216	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: REVENU_FR__MILIARD_USD_
Date: 09/28/21 Time: 17:35
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.83045	0.9664	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.53942	0.9381	5	90
ADF - Fisher Chi-square	12.7812	0.2362	5	90
PP - Fisher Chi-square	32.2525	0.0004	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: FOREIGN_BRANDS
Date: 09/28/21 Time: 17:38
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	1.80882	0.9648	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.41682	0.9217	5	90
ADF - Fisher Chi-square	13.9064	0.1773	5	90
PP - Fisher Chi-square	12.4834	0.2540	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: DOMESTIC_BRANDS
Date: 09/28/21 Time: 17:51
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.54278	0.2936	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	2.41994	0.9922	5	90
ADF - Fisher Chi-square	4.19611	0.9381	5	90
PP - Fisher Chi-square	2.43324	0.9918	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

1st difference

Panel unit root test: Summary
Series: D(NBR_JOBS)
Date: 09/28/21 Time: 17:31
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.09512	0.0010	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.78058	0.0001	5	85
ADF - Fisher Chi-square	37.8759	0.0000	5	85
PP - Fisher Chi-square	37.1414	0.0001	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(REVENU_FR__MILIARD_USD_)
Date: 09/28/21 Time: 17:36
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.69669	0.0035	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.44898	0.0072	5	85
ADF - Fisher Chi-square	29.2440	0.0011	5	85
PP - Fisher Chi-square	284.559	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(FOREIGN_BRANDS)
Date: 09/28/21 Time: 17:49
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.83639	0.0000	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.09902	0.0000	5	85
ADF - Fisher Chi-square	37.2534	0.0001	5	85
PP - Fisher Chi-square	103.063	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(DOMESTIC_BRANDS)
Date: 09/28/21 Time: 17:52
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-1.43123	0.0762	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.31674	0.0103	5	85
ADF - Fisher Chi-square	23.1427	0.0102	5	85
PP - Fisher Chi-square	31.9942	0.0004	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: GDR
Date: 10/08/21 Time: 10:41
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.84252	0.8003	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.69996	0.9554	5	90
ADF - Fisher Chi-square	6.82322	0.7420	5	90
PP - Fisher Chi-square	4.04815	0.9451	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(GDR)
Date: 10/08/21 Time: 10:42
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.69112	0.0000	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.29836	0.0005	5	85
ADF - Fisher Chi-square	28.7078	0.0014	5	85
PP - Fisher Chi-square	44.1368	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: GDR_RAT
Date: 10/08/21 Time: 10:43
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.14820	0.0158	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.14956	0.1252	5	90
ADF - Fisher Chi-square	14.2648	0.1613	5	90
PP - Fisher Chi-square	23.2047	0.0100	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(GDR_RAT)
Date: 10/08/21 Time: 10:43
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.35205	0.0000	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.10479	0.0000	5	85
ADF - Fisher Chi-square	52.2401	0.0000	5	85
PP - Fisher Chi-square	296.988	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: LABOR_FEM
Date: 10/08/21 Time: 10:46
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.29933	0.0107	5	90
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-1.85710	0.0316	5	90
ADF - Fisher Chi-square	22.1096	0.0146	5	90
PP - Fisher Chi-square	18.3475	0.0494	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(LABOR_FEM)
Date: 10/08/21 Time: 10:46
Sample: 2000 2019
Exogenous variables: Individual effects
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.24288	0.0000	5	85
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.57728	0.0002	5	85
ADF - Fisher Chi-square	31.9821	0.0004	5	85
PP - Fisher Chi-square	46.2854	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: ECO_FREE
Date: 10/08/21 Time: 10:48
Sample: 2000 2019
Exogenous variables: None
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-0.88861	0.1871	5	90
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	6.37115	0.7832	5	90
PP - Fisher Chi-square	8.14721	0.6145	5	95

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary
Series: D(ECO_FREE)
Date: 10/08/21 Time: 10:49
Sample: 2000 2019
Exogenous variables: None
User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.06233	0.0000	5	85
Null: Unit root (assumes individual unit root process)				
ADF - Fisher Chi-square	50.6445	0.0000	5	85
PP - Fisher Chi-square	52.3455	0.0000	5	90

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

APPENDIX 6. KAO COINTÉGRATION TEST

Kao Residual Cointegration Test
Series: GDR NBR_JOBS DOMESTIC_BRANDS FOREIGN_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 10:28
Sample: 2000 2019
Included observations: 100
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 4
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-1.893230	0.0292
Residual variance	1160377.	
HAC variance	1429759.	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 10/09/21 Time: 10:28
Sample (adjusted): 2002 2019
Included observations: 90 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.227981	0.056036	-4.068448	0.0001
D(RESID(-1))	0.266142	0.098679	2.697044	0.0084

R-squared	0.179813	Mean dependent var	106.2914
Adjusted R-squared	0.170493	S.D. dependent var	1170.331
S.E. of regression	1065.906	Akaike info criterion	16.80301
Sum squared resid	99981707	Schwarz criterion	16.85856
Log likelihood	-754.1354	Hannan-Quinn criter.	16.82541
Durbin-Watson stat	2.120763		

Kao Residual Cointegration Test
Series: COMP_INT NBR_JOBS FOREIGN_BRANDS DOMESTIC_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 11:27
Sample: 2000 2019
Included observations: 100
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 4
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-0.911130	0.1811
Residual variance	0.192091	
HAC variance	0.188151	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 10/09/21 Time: 11:27
Sample (adjusted): 2002 2019
Included observations: 90 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.458361	0.137362	-3.336894	0.0012
D(RESID(-1))	0.314894	0.142987	2.202265	0.0303

R-squared	0.087482	Mean dependent var	0.075529
Adjusted R-squared	0.077113	S.D. dependent var	0.448895
S.E. of regression	0.431240	Akaike info criterion	1.177668
Sum squared resid	16.36518	Schwarz criterion	1.233219
Log likelihood	-50.99506	Hannan-Quinn criter.	1.200070
Durbin-Watson stat	2.140330		

Kao Residual Cointegration Test
Series: LABOR_FEM NBR_JOBS FOREIGN_BRANDS DOMESTIC_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 11:44
Sample: 2000 2019
Included observations: 100
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 4
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-3.028754	0.0012
Residual variance	3.905194	
HAC variance	3.155086	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 10/09/21 Time: 11:44
Sample (adjusted): 2004 2019
Included observations: 80 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.793890	0.142832	-5.558192	0.0000
D(RESID(-1))	0.583844	0.132813	4.395985	0.0000
D(RESID(-2))	-0.018597	0.110795	-0.167853	0.8671
D(RESID(-3))	0.337387	0.109874	3.070674	0.0030

R-squared	0.395773	Mean dependent var	0.127236
Adjusted R-squared	0.371922	S.D. dependent var	2.183852
S.E. of regression	1.730733	Akaike info criterion	3.983674
Sum squared resid	227.6532	Schwarz criterion	4.102775
Log likelihood	-155.3469	Hannan-Quinn criter.	4.031425
Durbin-Watson stat	2.072632		

Kao Residual Cointegration Test
Series: FR_LAWS NBR_JOBS DOMESTIC_BRANDS FOREIGN_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 12:21
Sample: 2000 2019
Included observations: 100
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 4
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-1.129436	0.1294
Residual variance	0.020751	
HAC variance	0.017710	

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RESID)
Method: Least Squares
Date: 10/09/21 Time: 12:21
Sample (adjusted): 2001 2019
Included observations: 95 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.251458	0.067682	-3.715280	0.0003

R-squared	0.127632	Mean dependent var	-0.003465
Adjusted R-squared	0.127632	S.D. dependent var	0.160689
S.E. of regression	0.150085	Akaike info criterion	-0.944764
Sum squared resid	2.117388	Schwarz criterion	-0.917881
Log likelihood	45.87629	Hannan-Quinn criter.	-0.933901
Durbin-Watson stat	1.816588		

APPENDIX 7. PEDRONI COINTEGRATION TESTS

Pedroni Residual Cointegration Test
Series: GDR NBR_JOBS DOMESTIC_BRANDS FOREIGN_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 10:36
Sample: 2000 2019
Included observations: 100
Cross-sections included: 4 (1 dropped)
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.136865	0.1278	1.930185	0.0268
Panel rho-Statistic	0.804337	0.7894	1.011177	0.8440
Panel PP-Statistic	-1.874057	0.0305	-1.591313	0.0558
Panel ADF-Statistic	-1.866951	0.0310	-1.525201	0.0636

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.998896	0.9772
Group PP-Statistic	-3.510304	0.0002
Group ADF-Statistic	-1.517328	0.0646

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
South Africa	0.616	178054.2	193326.4	2.00	19
Brazil	0.238	811613.1	774581.7	2.00	19
China	-0.159	50355.03	8497.987	18.00	19
India	Dropped from Test				
Russian Fede...	-0.143	934793.2	859414.2	2.00	19

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
South Africa	0.616	178054.2	0	2	19
Brazil	0.238	811613.1	0	2	19
China	-0.743	40216.12	1	2	18
India	Dropped from Test				
Russian Fede...	-0.143	934793.2	0	2	19

Pedroni Residual Cointegration Test
Series: COMP_INT NBR_JOBS FOREIGN_BRANDS DOMESTIC_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 11:31
Sample: 2000 2019
Included observations: 100
Cross-sections included: 4 (1 dropped)
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	0.513787	0.3037	0.215904	0.4145
Panel rho-Statistic	1.281595	0.9000	1.029437	0.8484
Panel PP-Statistic	-0.165413	0.4343	-0.989429	0.1612
Panel ADF-Statistic	-0.130843	0.4479	-0.650491	0.2577

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.829334	0.9663
Group PP-Statistic	-1.316188	0.0941
Group ADF-Statistic	-0.444158	0.3285

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
South Africa	0.267	0.088101	0.086141	2.00	19
Brazil	-0.173	0.095663	0.043476	5.00	19
China	0.460	0.182056	0.210024	1.00	19
India	Dropped from Test				
Russian Fede...	0.048	0.028698	0.027850	1.00	19

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
South Africa	0.267	0.088101	0	2	19
Brazil	-0.173	0.095663	0	2	19
China	0.460	0.182056	0	2	19
India	Dropped from Test				
Russian Fede...	-0.263	0.022307	2	2	17

Pedroni Residual Cointegration Test
Series: LABOR_FEM NBR_JOBS FOREIGN_BRANDS DOMESTIC_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 12:08
Sample: 2000 2019
Included observations: 100
Cross-sections included: 4 (1 dropped)
Null Hypothesis: No cointegration
Trend assumption: No deterministic intercept or trend
Automatic lag length selection based on SIC with a max lag of 3
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-2.067950	0.9807	-2.098415	0.9821
Panel rho-Statistic	1.336766	0.9094	1.448585	0.9263
Panel PP-Statistic	-0.306090	0.3798	-1.232530	0.1089
Panel ADF-Statistic	-0.709550	0.2390	-5.704779	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.910947	0.9720
Group PP-Statistic	-4.203802	0.0000
Group ADF-Statistic	-4.933219	0.0000

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
South Africa	0.140	20.58838	5.635049	18.00	19
Brazil	0.276	90.30885	74.19118	2.00	19
China	0.547	99.35635	37.55331	7.00	19
India	Dropped from Test				
Russian Fede...	0.657	197.5537	161.4667	3.00	19

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
South Africa	-0.230	16.75601	1	3	18
Brazil	0.276	90.30885	0	3	19
China	-0.391	23.79487	3	3	16
India	Dropped from Test				
Russian Fede...	0.657	197.5537	0	3	19

Pedroni Residual Cointegration Test
Series: FR_LAWS NBR_JOBS DOMESTIC_BRANDS FOREIGN_BRANDS REVENU_FR__MILIARD_USD_
Date: 10/09/21 Time: 12:23
Sample: 2000 2019
Included observations: 100
Cross-sections included: 2 (3 dropped)
Null Hypothesis: No cointegration
Trend assumption: Deterministic intercept and trend
Automatic lag length selection based on SIC with a max lag of 2
Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-48.66116	1.0000	-0.258184	0.6019
Panel rho-Statistic	0.710892	0.7614	0.706402	0.7600
Panel PP-Statistic	-0.790658	0.2146	-0.805929	0.2101
Panel ADF-Statistic	-0.847631	0.1983	-0.862679	0.1942

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	1.251748	0.8947
Group PP-Statistic	-0.527385	0.2990
Group ADF-Statistic	-0.582692	0.2801

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
South Africa	0.208	0.040193	0.037594	2.00	19
Brazil	Dropped from Test				
China	0.078	0.037986	0.033480	3.00	19
India	Dropped from Test				
Russian Federation	Dropped from Test				

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
South Africa	0.208	0.040193	0	2	19
Brazil	Dropped from Test				
China	0.078	0.037986	0	2	19
India	Dropped from Test				
Russian Federation	Dropped from Test				

APPENDIX 8. GRANGER CAUSALITY RESULTS

Pairwise Granger Causality Tests
Date: 10/09/21 Time: 17:25
Sample: 2000 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(NBR_JOBS) does not Granger Cause D(GDR)	85	0.00787	0.9922
D(GDR) does not Granger Cause D(NBR_JOBS)		0.36198	0.6974
D(FOREIGN_BRANDS) does not Granger Cause D(GDR)	85	0.71932	0.4902
D(GDR) does not Granger Cause D(FOREIGN_BRANDS)		0.09289	0.9114
D(DOMESTIC_BRANDS) does not Granger Cause D(GDR)	85	2.09927	0.1292
D(GDR) does not Granger Cause D(DOMESTIC_BRANDS)		0.83412	0.4380
D(FR_LAWS) does not Granger Cause D(GDR)	85	0.24402	0.7840
D(GDR) does not Granger Cause D(FR_LAWS)		0.01245	0.9876
D(FOREIGN_BRANDS) does not Granger Cause D(NBR_JOBS)	85	10.2444	0.0001
D(NBR_JOBS) does not Granger Cause D(FOREIGN_BRANDS)		0.73031	0.4849
D(DOMESTIC_BRANDS) does not Granger Cause D(NBR_JOBS)	85	7.24863	0.0013
D(NBR_JOBS) does not Granger Cause D(DOMESTIC_BRANDS)		0.74559	0.4777
D(FR_LAWS) does not Granger Cause D(NBR_JOBS)	85	0.10346	0.9018
D(NBR_JOBS) does not Granger Cause D(FR_LAWS)		3.80890	0.0263
D(DOMESTIC_BRANDS) does not Granger Cause D(FOREIGN_BRANDS)	85	1.27626	0.2847
D(FOREIGN_BRANDS) does not Granger Cause D(DOMESTIC_BRANDS)		0.35074	0.7052
D(FR_LAWS) does not Granger Cause D(FOREIGN_BRANDS)	85	1.60163	0.2080
D(FOREIGN_BRANDS) does not Granger Cause D(FR_LAWS)		0.09556	0.9090
D(FR_LAWS) does not Granger Cause D(DOMESTIC_BRANDS)	85	3.15584	0.0480
D(DOMESTIC_BRANDS) does not Granger Cause D(FR_LAWS)		0.09602	0.9086

Pairwise Granger Causality Tests
Date: 10/09/21 Time: 17:29
Sample: 2000 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(NBR_JOBS) does not Granger Cause D(COMP_INT)	85	0.75292	0.4743
D(COMP_INT) does not Granger Cause D(NBR_JOBS)		1.12820	0.3287
D(FOREIGN_BRANDS) does not Granger Cause D(COMP_INT)	85	0.30116	0.7408
D(COMP_INT) does not Granger Cause D(FOREIGN_BRANDS)		1.67558	0.1937
D(DOMESTIC_BRANDS) does not Granger Cause D(COMP_INT)	85	2.35787	0.1012
D(COMP_INT) does not Granger Cause D(DOMESTIC_BRANDS)		2.79179	0.0673
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(COMP_INT)	85	0.08537	0.9183
D(COMP_INT) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		0.31356	0.7317
D(FOREIGN_BRANDS) does not Granger Cause D(NBR_JOBS)	85	10.2444	0.0001
D(NBR_JOBS) does not Granger Cause D(FOREIGN_BRANDS)		0.73031	0.4849
D(DOMESTIC_BRANDS) does not Granger Cause D(NBR_JOBS)	85	7.24863	0.0013
D(NBR_JOBS) does not Granger Cause D(DOMESTIC_BRANDS)		0.74559	0.4777
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(NBR_JOBS)	85	17.3390	6.E-07
D(NBR_JOBS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.81680	0.1692
D(DOMESTIC_BRANDS) does not Granger Cause D(FOREIGN_BRANDS)	85	1.27626	0.2847
D(FOREIGN_BRANDS) does not Granger Cause D(DOMESTIC_BRANDS)		0.35074	0.7052
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(FOREIGN_BRANDS)	85	0.07237	0.9302
D(FOREIGN_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		19.7626	1.E-07
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(DOMESTIC_BRANDS)	85	0.94977	0.3911
D(DOMESTIC_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.54327	0.2200

Pairwise Granger Causality Tests
Date: 10/09/21 Time: 17:33
Sample: 2000 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(NBR_JOBS) does not Granger Cause D(LABOR_FEM)	85	1.44548	0.2417
D(LABOR_FEM) does not Granger Cause D(NBR_JOBS)		0.66510	0.5170
D(FOREIGN_BRANDS) does not Granger Cause D(LABOR_FEM)	85	1.31455	0.2743
D(LABOR_FEM) does not Granger Cause D(FOREIGN_BRANDS)		0.70151	0.4989
D(DOMESTIC_BRANDS) does not Granger Cause D(LABOR_FEM)	85	0.05401	0.9475
D(LABOR_FEM) does not Granger Cause D(DOMESTIC_BRANDS)		0.98284	0.3787
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(LABOR_FEM)	85	3.69640	0.0291
D(LABOR_FEM) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		0.07532	0.9275
D(FOREIGN_BRANDS) does not Granger Cause D(NBR_JOBS)	85	10.2444	0.0001
D(NBR_JOBS) does not Granger Cause D(FOREIGN_BRANDS)		0.73031	0.4849
D(DOMESTIC_BRANDS) does not Granger Cause D(NBR_JOBS)	85	7.24863	0.0013
D(NBR_JOBS) does not Granger Cause D(DOMESTIC_BRANDS)		0.74559	0.4777
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(NBR_JOBS)	85	17.3390	6.E-07
D(NBR_JOBS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.81680	0.1692
D(DOMESTIC_BRANDS) does not Granger Cause D(FOREIGN_BRANDS)	85	1.27626	0.2847
D(FOREIGN_BRANDS) does not Granger Cause D(DOMESTIC_BRANDS)		0.35074	0.7052
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(FOREIGN_BRANDS)	85	0.07237	0.9302
D(FOREIGN_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		19.7626	1.E-07
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(DOMESTIC_BRANDS)	85	0.94977	0.3911
D(DOMESTIC_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.54327	0.2200

Pairwise Granger Causality Tests
Date: 10/09/21 Time: 17:35
Sample: 2000 2019
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
D(NBR_JOBS) does not Granger Cause D(FR_LAWS)	85	3.80890	0.0263
D(FR_LAWS) does not Granger Cause D(NBR_JOBS)		0.10346	0.9018
D(FOREIGN_BRANDS) does not Granger Cause D(FR_LAWS)	85	0.09556	0.9090
D(FR_LAWS) does not Granger Cause D(FOREIGN_BRANDS)		1.60163	0.2080
D(DOMESTIC_BRANDS) does not Granger Cause D(FR_LAWS)	85	0.09602	0.9086
D(FR_LAWS) does not Granger Cause D(DOMESTIC_BRANDS)		3.15584	0.0480
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(FR_LAWS)	85	0.64590	0.5269
D(FR_LAWS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		0.14239	0.8675
D(FOREIGN_BRANDS) does not Granger Cause D(NBR_JOBS)	85	10.2444	0.0001
D(NBR_JOBS) does not Granger Cause D(FOREIGN_BRANDS)		0.73031	0.4849
D(DOMESTIC_BRANDS) does not Granger Cause D(NBR_JOBS)	85	7.24863	0.0013
D(NBR_JOBS) does not Granger Cause D(DOMESTIC_BRANDS)		0.74559	0.4777
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(NBR_JOBS)	85	17.3390	6.E-07
D(NBR_JOBS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.81680	0.1692
D(DOMESTIC_BRANDS) does not Granger Cause D(FOREIGN_BRANDS)	85	1.27626	0.2847
D(FOREIGN_BRANDS) does not Granger Cause D(DOMESTIC_BRANDS)		0.35074	0.7052
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(FOREIGN_BRANDS)	85	0.07237	0.9302
D(FOREIGN_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		19.7626	1.E-07
D(REVENU_FR__MILIARD_USD_) does not Granger Cause D(DOMESTIC_BRANDS)	85	0.94977	0.3911
D(DOMESTIC_BRANDS) does not Granger Cause D(REVENU_FR__MILIARD_USD_)		1.54327	0.2200