Determinants of FDI in France: Role of Transport Infrastructure, Education, Financial Development and Energy Consumption

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Abstract: This paper explores the effect of education and transportation infrastructure on foreign direct investment for the French economy over the period of 1965-2017. Economic growth, financial development and electricity consumption are also considered as additional determinants of foreign direct investment. In so doing, the SOR unit root test is applied in order to examine unit root properties of variables in the presence of sharp and smooth structural breaks in the series. To examine the presence of cointegration between the variables, the bootstrapping ARDL cointegration test is applied. The empirical results show the presence of cointegration between the variables. Education and transportation add to foreign direct investment. Financial development declines foreign direct investment. The relationship between electricity consumption (economic growth) and foreign direct investment is bidirectional. The nonlinear relationship between education (transportation infrastructure) and foreign direct investment is U-shaped.

Keywords: FDI, Transport infrastructure, Education, Financial Development, and Energy Consumption., bootstrapping ARDL.

I. Introduction

A major focus in foreign direct investment (FDI) literature has been devoted to detecting the factors that drive changes in FDI inflows, as well as understanding the role that these inflows play in economic growth and development. This is because identifying FDI friendly policies is crucial for policymakers as FDI is an important source of funds and vehicle for technology transfer (Liu, 2008; Keller, 2010). Furthermore, FDI inflows are sensitive to certain country-specific features, including economies of agglomeration, degree of economic and political stability, institutional background, location costs, regulatory reforms, the extent of corruption, liberalization policies, conditions of human capital, labor cost, markets size, proximity to larger markets, the degree of economic openness, conditions of human capital, and labor costs. Assuncao et al. (2011) categorized these factors into three main determinants of FDI including location which relate to infrastructure, human capital, and so on, institutions which relate to corruption, political instability, and so on, and factors related to trade theory as openness, factor endowments etc. Financial development should certainly be added to this list.

It has been argued that financial development enhances economic growth directly as well as indirectly through its impact on domestic capital accumulation and total factor productivity. Choong and Lam (2011) find that financial development is a significant prerequisite for FDI to have a positive effect on economic growth, while Hermes and Lensink (2003) report that the FDI enhances economic growth only if financial sector in the host country is well-developed. In addition, Donaubauer et al. (2016) find that that bilateral FDI increases with better developed financial markets in both the host and the source country. Additionally, they report that financial market development in the developing host country and financial market development in the FDI source country function as substitutes for each other. Few empirical studies investigate the relationship between foreign direct investment (FDI) and economic growth in the presence of financial market development for a specific country as opposed to cross-sectional studies. For example, Shahbaz et al. (2011) investigated the case of Portugal and found that financial development and FDI exert positive impact on economic growth. Similar results are reported for Malaysia (Choong and Lim, 2009) and Thailand (Ang, 2008). Yao et al. (2018) examined the effect of host-location financial development (HFD) on foreign direct investment (FDI) in 166 Chinese cities between 2003 and 2009. Their study finds a complementary relationship between

HFD and FDI across Chinese cities. More specifically, the positive HFD–FDI nexus is predominantly driven by the external-finance and agglomeration effects and is more pronounced for interior and smaller cities. Similarly, Wang and Liu (2017) examined the relationship between FDI spillovers effects and financial development in different regions of China, using regional panel data from 2000 to 2014. Their results revealed that there are two thresholds of financial development (as proxied by scale, structure and efficiency), existing in the FDI spillover processes in different regions.

The choice of France is very appropriate given the significant amount of FDI that the country attracted in 2017. The World Investment Report 2018 (UNCTAD 2018) shows that France was able to attract approximately 50 billion in 2017 amounting to an increase of 77% from 2016, and making France the world's 9th top economy in term of FDI inflows. It is estimated that Paris is the world's second-largest host to multinational headquarters, with 500 multinationals have their home office in that city. Furthermore, the current administration's goals of attracting more multinationals currently in other countries is a clear indication of the recent importance of FDI for France. Moreover, the country is one of the world's top ten economic powers with quality infrastructure, qualified and productive workforce, and good business and legal environment.

This study contributes to the existing literature in various aspects: (i), This paper explores the relationship between transportation infrastructure, education, financial development and foreign direct investment in France. (ii), We apply sharp and smooth structural unit root test developed by Shahbaz et al. (2018) for examining the unit root properties of the variables. (iii), The bootstrapping ARDL bounds testing is applied to investigate cointegration between foreign direct investment and its determinants. (iv), The causal relationship between the variables is examined by applying VECM Granger causality and the robustness of causality analysis is tested by innovative accounting approach. This empirical analysis provides appropriate policy implications to maintain economic development via attracting foreign direct investment to French economy.

The rest of paper is organized as following: Section-II details review of literature. Section-III shows model construction and data collection. The methodological strategy is explained in

Section-IV and results are interpreted in Section-V. Section-VI deals with conclusion and policy implications.

II. Literature Review

II.I Transportation Infrastructure and FDI Nexus

A reliable and efficient transport infrastructure (roads & bridges, airports, ports & navigable waterways and communications network among others) of a country result in improved transport accessibility and reduced transport costs. Firms benefit from these factors as it results in lower cost as sufficient supply of transport infrastructure at no or little costs to users is inferred to have a positive impact on costs and productivity of firms and increasing their profits. Higher profit rate in one country relative to other counties is a reasonable cause why foreign direct investment would like to locate in a foreign country. Furthermore, Shatz and Venables (2000) distinguished between 'horizontal' and 'vertical' reason why foreign direct investors would like to locate in a foreign country. Horizontal involves market seeking expansion by the firm since it involves duplication of production plants where the main motivation is to save on tariffs and transport costs of the products produced to expand the market of the products of the company. Vertical involves relocation of production facilities to save on production costs by having access to lower-cost inputs to maximize the profits on total production of the firm.

Transport infrastructure is possibly seen to have more impact on FDI associated with vertical reason. When a firm establishes production facilities abroad to take advantage of lower labour costs but faces higher transportation costs and undependable transportation services, it will not elect to do business in that foreign country. This will not be the case if a publicly provided and maintained transportation system is available allowing companies to use such freely provided and maintained highway system to obtain and ship its products. This will result in cutting the cost per unit of output as the company combines its capital with free (public) capital, thereby cutting the cost per unit of output (Erenberg, 1993). Furthermore, sufficient evidence advocates that the unintended spillovers from agglomeration formed by public infrastructure lower the costs of firms (Haughwout, 2001; Limao and Venables, 2001). In sum, the above review provides theoretical support that transport infrastructure, being an unpaid input, is an important determinant in attracting FDI through its impact on productivity and cost structure of firms considering their

location for FDI. High costs associated with inefficient transportation infrastructure in a labour-intensive country can hinder that economy from the benefits of attracting international firms to it when transportation infrastructure disadvantages offset any advantage associated with such cheap labour. Undoubtedly, capital, labour and other classical determinants of production remain central, especially for firm's decisions in times of budget constraint.

In contrast to the outpouring of research on the impact of many factors that have been identified as determinants of FDI location, (including economies of agglomeration, markets size and proximity to larger markets; taxes; labor costs; institutional background and location costs), empirical work on the relation of transport infrastructure to FDI location has been relatively scant. However, a considerable volume of literature has emphasized the importance of physical infrastructure as a determinant of economic growth (e.g., early work of Aschauer 1989). Given that transportation infrastructure is a major component of a country's infrastructure, our review of studies includes also some studies that covered physical infrastructure. For instance, the study by Wheeler and Mody (1992) is one of the earliest work that used quality of transport, communications and energy infrastructure as a proxy for infrastructure in a study covering a panel of 42 countries for the 1982- 1988 sample showing it to have large positive effect on investment. Loree and Guisinger (1995) examined the effects of policy and non-policy variables on the location of new U.S. direct investment abroad using 1977 and 1982 Benchmark data. Their results show statistically significant positive effects for investment incentives, negative effects for performance requirements, and host country effective tax rates on foreign direct investment. They also reported significant effects for political stability, cultural distance, GDP per capita, and infrastructure. Cheng and Kwan (2000) estimated the effects of the determinants of foreign direct investment (FDI) in 29 Chinese regions using a balanced panel of 29 regions over an 11-year period from 1985 to 1995. Their results indicated that a large regional market, good infrastructure, and preferential policy positively affect FDI while wage cost has a negative effect. In addition, the effect of education was found to be positive but not significant.

Kumar (2001) studied the role of infrastructure availability in determining the appeal of countries for FDI inflows and for export-orientation of multinational enterprises (MNE) production. A composite index of infrastructure availability is created catching availability of transport

infrastructure, telecommunications infrastructure, information infrastructure, and energy availability for 66 countries over 1982-1994 period using the principal component analysis. This is evaluated in the framework of an extended model of foreign production. The estimations validate that infrastructure availability does contribute to the relative attractiveness of a country towards FDI by MNEs. Additionally, the export-orientation of production of MNE affiliates is significantly related to infrastructure availability. Sekkat and Veganzones-Varoudakis (2004) revealed, for a panel of 72 countries, including 8 MENA countries, studied during the 1990s, that trade and foreign exchange liberalization established a key reason for the attractiveness of a country in terms of attracting FDI. Furthermore, physical infrastructure, macroeconomic conditions, human capital, political environment and macroeconomic conditions – were found to strengthen their results. They called for all MENA countries to make a considerable effort to expand their physical infrastructure to be able to attract FDI as the gap in this compared to East Asia has been found to contribute to the deficit in FDI flows to the MENA region. Meanwhile, Asiedu (2006) examined the determinants of FDI to Africa by conducting an analysis that covered 22 countries in Sub-Saharan Africa (SSA), for the period of 1984–2000. The empirical results showed that good infrastructure of a country was among the important variables that promoted inward FDI. Other variables included the existence of large local markets, endowments of natural resources, little inflation, a well-organized legal system, and a thorough investment framework while corruption and political instability have discouraged FDI inflow.

Goodspeed et al. (2007) used an unbalanced panel of 53 developed and developing countries to examine the effect of tax rate, infrastructure index, and corruption index on FDI. Their results show that lower taxes and improved infrastructure attract FDI with acceptable provision of infrastructure as important as low taxes in attracting FDI. They recommended that governments aiming at attracting foreign direct investment need to keep taxes low but to also keep investing in infrastructure. Yol and Teng (2009), using annual data for 1975-2006 for Malaysia and utilizing ECM, found that 1% improvement in infrastructure would increase FDI flows by approximately 2.6% annually. Khadaroo and Seetanah (2010) analyzed the impact of infrastructure, mostly with respect to transportation, in determining the appeal of foreign direct investment (FDI) inflows. Their study was originally based on the state of Mauritius for the period 1960-2004 using an ARDL approach. They found that transport infrastructure readiness is seen to have contributed to the

attractiveness of the country to receiving FDI. Similarly, Akpan et al. (2014) used panel analysis to study the determinants of foreign direct investment in Brazil, Russia, India, China, and South Africa (BRICS) and Mexico, Indonesia, Nigeria, and Turkey (MINT), using data for the period 2001–2011. Their empirical results indicated that market size, infrastructure availability, and trade openness are significant variables in enticing FDI to BRICS and MINT although availability of natural resources and institutional quality were found to be insignificant. Further, Ahmad et al. (2015) examined the impact of infrastructure on foreign direct investment in Malaysia from 1980 to 2013 using ARDL method. They reported results showing that GDP, exchange rate, and infrastructure have positive impact on FDI in Malaysia. More recently, Barua et al. (2017) reexamined the impact of infrastructure and economic environment on FDI inflow on 81 developed and developing countries for the period 1995-2013. Their results find that countries with poorer infrastructure in terms of electricity and other utility facilities are not able to attract as much FDI as those who have developed infrastructure.

II.II Education and FDI Nexus

Education can improve labour productivity, encourage the creation of modern technologies, increase the innovative capacity of a country, help individuals become better citizens and help the dissemination of knowledge in the economy. Such elements imply that the quality of human capital is an essential ingredient for attracting FDI. Furthermore, the quality of human capital is also considered to be one of the most challenging barriers to FDI inflows (see e.g., Assuncao et al. 2011). The suitability and adequacy of the education system have been considered one of the drivers of the quality of human capital. For instance, Psacharopoulos (1986) provided one of the earlier work that investigated the adequacy of education system using a model that measures the misallocation cost on the labour market stemming from education system. Topel (1997) distinguished between the static and the dynamic adequacy where the later considers future demand on labor market and the desired adjustment in education system accordingly. Vincens (2005) focused on defining qualitative and measurable adequacy of education system, whereas Plassard and Tran (2009) designated over-education as a feature of the education system inadequacy. Accordingly, over-education, or waste of resources, occurs when the number of years of schooling is higher than the needed education necessary to hold a given position. Recent research turned the attention toward the question of whether FDI encourages economic growth

more profoundly given the existence of certain social and economic conditions of the country receiving the FDI.

An important study by Borensztein et al. (1998) found that FDI has a positive effect on productivity growth and on income growth only if the recipient country has attained a given level of human capital. They used data on inward FDI in 69 LDCs for the period 1970–1989 and reported results showing that FDI encourages the host country's economic growth rate only if it has reached a threshold level of human capital, measured by the average years of secondary schooling. Wang et al. (2012) revisited the results of Borensztein et al. (1998) by adjusting the original schooling data by two 'quality of education' indices and re-estimated their model. They confirmed the results reported by Borensztein et al. (1998) but showed the threshold level of schooling in their study to be lower than the threshold calculated in Borensztein et al. (1998). Their results supported the importance of education quality and imply that with improved quality of education, it does not take as many years of schooling, as reported in Borensztein et al. (1998), for inward FDI to have a constructive impact on economic growth in the host country. These findings were also confirmed in other studies such as Xu (2000) and Chang et al. (2009). The results suggested that human capital is one of the important determinants for the location of FDI flows, have been further supported by Brooks et al. (2010). However, further research by Cheng and Kwan (2000), Hong (2008), Cleeve et al. (2015), found that human capital is not a significant determinant for FDI.

Recently, Miningou and Tapsoba (2017) examined the effect of the efficiency of the education system on FDI. They follow the established education internal and external efficiency. The former is defined as the ability of education system to utilize its inputs to provide high-quality education services, while the latter refers to producing skilled labour that matches demand on labor market which is their focus. This is because the education system builds on the theory of human capital which suggests that education inclines to enhance skills and productivity and increases employees' lifetime earnings. Mouhoud (2013) argued that the external efficiency of the education system and FDI inflows are related for several reasons. They relate to foreign investors attraction by the quality and the relevance of the expertise of labour force in a given developing country, multinational firms interest in subcontracting with countries' companies that has highly skilled employees and trained labour are available. Miningou and Tapsoba (2017) used data from 1990 to 2010 on near

90 countries and applied stochastic frontier model to build a frontier of labour remuneration which is a proxy of the maximum labour remuneration that countries could reach, given various levels of the average years of schooling. Their results show a positive relationship between the external efficiency of education system and FDI. The study indicates an increase of 18 per cent in the FDI net inflow per unit of employment after a standard deviation improvement in the efficiency score. Their study, therefore, provides evidence that though the years of schooling alone do not have any impact on FDI inflows, external efficiency of education system has a positive effect on FDI.

In another recent paper, Kheng et al. (2017) utilized country-level panel data for 55 developing countries for 1980–2011 using analysis built on simultaneous equations fixed effect estimation. Their results disclose significant bi-directional causality between human capital and FDI. They concluded that there is a need to increase spending on education and training to improve human capital development and make FDI-led economic growth models more applicable to all developing countries. It is well noted that producing skilled labour that matches demand on the labour market should be an important outcome of any education system so the system can be of value in building human capital which does attract FDI. The fact that FDI is mostly nowadays geared to knowledge and skill-intensive industries indicate that countries with higher levels of human capital are more attractive to foreign investors (Miyamoto, 2003). Therefore, attention should focus on studying the nature of skills needed to attract FDI, and ways in which training institutions, firms and universities' business schools can provide training to increase the appeal of their countries to FDI. In addition, the literature review also suggests that implicitly, the education level of the labour force will provide the workers with broad knowledge that is also valuable for attracting FDI. This is consistent with a report by UNCTAD (2018) that indicated that the concentration of international investments has shifted from the availability of rich natural resources to technology-centred services and industries over the past two decades. This obviously made education a very important factor in attracting FDI.

III.II Financial Development and FDI Nexus

Foreign direct investment is defined as an investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in a foreign country. There is rational that justify that a well-working financial system is a motivation particularly for multinational firms to

invest in host countries (King and Levine, 1993; Alfaro et al., 2008). Foreign enterprises prefer to invest in a country where the banking and financial sector system is more developed as they can easily access it and make use of the domestic financial markets. Also, an under-developed banking system may not be able to offer the foreign enterprises the level of facilities that they need to conduct their business as in most cases these enterprises are usually big and complex in their operations. In conducting its banking business, developing capital budgeting of its projects, and analyzing country risk, a foreign enterprise would prefer a location or a country with advanced financial system (Alfaro et al. 2008).

On the other hand, when foreign investors invest in a foreign economy, they make use of the domestic banking sector and financial markets. They will most likely open big accounts at local bank, and more likely demand higher quality of internationally comparable services from such institutions. This will make these banks use such funds for their lending activities and this will eventually encourage and accelerate domestic banking and financial sector development. Accordingly, FDI is seen to stimulate domestic banking and financial sector development. One can also argue that there is a bi-directional causation relationship between FDI and financial sector development as both effects may be occurring at the same time. For example, Najilee and Al Nasser (2015) find that financial market development has long-run effects on increasing the inward flow of FDI in 11 out of 14 Latin American countries. Additionally, they show that the link between inward FDI and banking sector development is unidirectional whereas the link between FDI and stock market development is bi-directional. Similarly, a study by Soumare and Tchana (2015) on emerging market economies over the period 1994–2006, documents bi-directional causality between FDI and stock market development indicators. For banking sector development indicators, the relationship is ambiguous and inconclusive. Bayar and Gavriletea (2018) arrived at similar results for a group of 11 Central and Eastern European Union (CEEU) countries. More specifically, they found unidirectional causal relationship running from the financial sector development to foreign investment inflows but not vice versa.

Furthermore, some studies claimed that FDI has no effect on financial development or even possibly could damage the potential development of financial system in host countries as it may deteriorate capital formation in domestic capital markets since funds are brought by direct external

investment and not through capital markets (Hausmann and Fernandez-Arias, 2001; Desbordes and Wei, 2014). However, Sahin and Ege (2015) find that FDI Granger causes financial development in some neighbouring countries which are either European Union (EU) members or candidates for EU accession (Bulgaria, Greece and Turkey). This implies that FDI increases the forecasts of financial development in these countries. Various studies also examined whether the condition of financial sector in host country is a variable that enhances economic growth resulting from FDI (Hermes and Lensink, 2003; Alfaro et al., 2004; Choong and Lam, 2011). For example, Lee and Chang (2009) find that, whereas the evidence of a short-run relationship is weak, that of a long-run relationship among FDI, financial development, and economic growth is unequivocal. What is more, there is clear evidence of bi-directional causal linkages among FDI, financial development, and economic growth.

To examine whether financial development helps a country to benefit more from FDI, Choong (2012) in his study of 95 developed and developing countries from 1983 to 2006, interacted FDI with different measures of financial sector development. The finding is that when FDI interacts with the financial development indicators, the interaction terms are generally positive and significant, showing the importance of financial sector development in benefiting from FDI. A recent study by Nkoa (2018) investigated the impact of financial development on FDI in 52 African countries from 1995 to 2015 using the Generalized Method of Moments (GMM). The study differentiates between African countries without financial market and those with the financial market and shows that financial development indicators with positive and significant influence on FDI are significantly different between the two groups of countries. Furthermore, a more developed financial system causes a country to experience increased FDI inflows by providing external finances under better economic conditions that may attract more FDI inflows (Desbordes and Wei, 2014).

Nevertheless, a relatively small number of papers have examined the interaction between FDI inflows and financial development. Among others, Claessens et al. (2001), Dutta and Roy (2008), Al Nasser and Gomez (2009), Abzari et al. (2011), Korgaonkar (2012), Agbloyor et al. (2013), Bayar and Ozel (2014), Sahin and Ege (2015), Fauzel (2016) and Enisan (2017) have examined this issue. However, the results are mixed. FDI inflows may affect the development of financial

sector positively by increasing the funds supplied in financial system from foreign investors, but can also have a negative impact on the development of financial sector, as FDI inflows are often regarded as an alternative financing instrument, or in other words, a competitor for domestic financial markets. Yet, FDI inflows may have no influence on the development of financial sector in a country (Bayar and Gavriletea, 2018). In a more recent study, Desbordes and Wei (2017) show that source and destination countries' financial development jointly promote FDI by directly increasing access to external finance and indirectly supporting overall economic activity. Governments willing to facilitate the internationalization of their firms and to attract foreign multinational enterprises (MNEs) should thus implement measures to improve access to external finance or maintain it during credit crises.

It may be concluded that there is no agreement in the results reported by all these studies. While some reported that financial development was a noteworthy factor that leads to more FDI to a country, other papers presented results showing that FDI inflows have made substantial contributions to the development of financial sectors in countries receiving FDI. Yet some showed that there is a negative relationship between FDI and financial development as FDI was found to be higher in countries that are financially underdeveloped, and are fragile institutionally. Finally, one should note that although conflicting results are reported, most of the above studies reviewed primarily show that FDI inflow does contribute to financial development.

II.III Energy Consumption and FDI Nexus

The nexus between energy consumption, foreign direct investment and economic growth have been widely discussed in the energy economics literature. This literature can be divided into three main lines (Omri and Kahouli, 2014). The first line of research focuses on the nexus between energy consumption and economic growth. This nexus suggests that economic growth and energy consumption might be jointly determined because higher economic growth requires more energy consumption; similarly, more efficient energy use needs a higher level of economic growth. The second line of researches has examined the relationship between foreign direct investment and economic growth. Nguyen and Nguyen (2007) and Anwar and Nguyen (2010), among others, have identified the two-way linkage between FDI and economic growth in which FDI promotes economic growth and, in turn, economic growth is viewed as a tool to attract FDI. The third line

of researches has examined the relationship between foreign direct investment and energy consumption. For example, Tang (2009) found that the influx of FDI is inducing energy consumption through the expansionary of industrialization, transportation and manufacturing sectors development, while energy is required to support the manufacturing process. Mielnik and Goldemberg (2000) reported a positive relationship between FDI and energy intensity in a sample of 20 developing countries. Similarly, Sadorsky (2010) found a positive and statistically significant relationship between FDI and energy consumption in a sample of 22 developing economies.

The nexus between energy consumption, foreign direct investment and economic growth was studied either in a single-country or multi-country context. Bekhet and Othman (2011) examined the causal relationship between electricity consumption and foreign direct investment in Malaysia, during the period of 1971–2009. The results were found to be cointegrated and indicated the existence of long-run causal relationship among the two variables. Bento (2011) showed a modest and negative effect of FDI on energy consumption in the context of Portugal, during the period of 1980–2007. In a more recent study, Ibrahiem (2015) examined the relationship between renewable electricity consumption, foreign direct investment and economic growth in Egypt. The study confirmed the presence of cointegration between economic growth, renewable electricity consumption and foreign direct investment, and that both renewable electricity consumption and foreign direct investment are correlated positively with economic growth. Salahuddin et al. (2018) examined the empirical effects of economic growth, electricity consumption, foreign direct investment (FDI), and financial development on carbon dioxide (CO_2) emissions in Kuwait for the period of 1980-2013. Findings indicated that economic growth, electricity consumption, and FDI stimulate CO_2 emissions in both the short and long run. Additionally, the VECM Granger causality analysis revealed that FDI, economic growth, and electricity consumption strongly Granger-cause CO_2 emissions in Kuwait. Similarly, Long et al. (2018) investigated the causal relationship between electricity consumption, foreign direct investment, and economic growth in Vietnam during the period 1990-2015. Their empirical results provided strong evidence that electricity consumption and FDI have positive impacts on economic growth in Vietnam in short term and long term.

In a multiple-country analysis, Omri and Kahouli (2014) examined the interaction between energy consumption, foreign direct investment and economic growth using a global panel of 65 countries and simultaneous equations models. Their study found that there are bi-directional causal relationships between energy consumption, FDI inflows and economic growth. More specifically, there is a bi-directional causal relationship between economic growth and energy consumption, and between economic growth and FDI inflows is, while the effect of FDI on energy consumption is found to be remarkable in the middle- or low-income countries than high-income countries. Similar results were reported by Abdouli and Hammami (2017); they investigated the relationship between FDI inflows, energy consumption, and economic growth for a panel of 17 MENA countries over the period of 1990-2012. Their main findings showed evidence of bi-directional causality between energy consumption and economic growth. Feedback hypothesis was validated between FDI inflows and economic growth. A unidirectional causality running from energy consumption to FDI inflows was identified. This implies that the increase in energy consumption increases the FDI inflows for individual and collective countries.

III. Empirical Modelling and Data Collection

This paper examines the role of transportation infrastructure in attracting FDI by considering the role of economic growth, education, financial development and energy consumption for the French economy. A well-established transportation infrastructure not only improves transport accessibility but also lowers transport cost which benefits to local firms as well as foreign investors. This lowers cost of production affects their productivity and profits as well. Similarly, higher profit relatively i.e. profit in one country compare to other, is noble cause where foreign investors should invest their money for locating in a foreign country (Shatz and Venables, 2000). Quality of labour is the most important factor of production that attracts foreign direct investment in host country. Education plays a vital role in improving the skill of labor which further helps in raising productivity, encouraging to create advanced technology and enhances the innovative capacity of country. These elements are considered the essential factors attracting FDI in a host country (Brooks et al. 2010, Assuncao et al. 2011). A well-established financial sector enables foreign investors to provide easy access not only to domestic resources but also to domestic financial markets. The multinationals prefer to invest in those countries who have well-developed financial system i.e. banking and stock market (King and Levine 1993, Alfaro et al. 2008). Energy

consumption is also considered an important factor of production which fuel the whole production process and availability of such factors of production is also an attractive point for foreigners to make investment in a host country. Following above discussion, the general foreign direct investment demand function is modelled as given below:

$$I_t = f(E_t,\ TR_t, Y_t,\ F_t, EC_t) \qquad (1)$$

where, I_t, E_t, TR_t, Y_t, F_t and EC_t are foreign direct investment, education, transport infrastructure, economic growth, financial development and energy consumption. We transformed all the variables into natural-log to attain empirically efficient results. Transformation of the variables into natural-log helps in reducing the sharpness in time series data. The empirical equation of foreign direct investment function is modelled as follows:

$$\ln I_t = \alpha_0 + \alpha_1 \ln E_t + \alpha_2 \ln TR_t + \alpha_3 \ln Y_t + \alpha_4 \ln F_t + \alpha_5 \ln EC_t + \mu_i \qquad (2)$$

where, $\ln$ and μ_i show natural-log and residual term. Education promotes foreign direct investment in the host country if $\alpha_1 > 0$ otherwise $\alpha_1 < 0$. $\alpha_2 > 0$ represents that transportation infrastructure adds to foreign direct investment and vice versa if $\alpha_2 < 0$. Economic growth is positively linked with foreign direct investment if $\alpha_3 > 0$ otherwise $\alpha_3 < 0$. $\alpha_4 > 0$ indicates that financial development contributes to foreign direct investment but on contrary, financial development impedes foreign direct investment if $\alpha_4 < 0$. Similarly, energy consumption adds to foreign direct investment if $\alpha_5 > 0$ otherwise $\alpha_5 < 0$.

To examine whether the relationship between education (transportation infrastructure, economic growth and financial development) and foreign direct investment, we have inserted squared term of education (transportation infrastructure, economic growth and financial development) into foreign direct investment demand function for French economy. The non-linear foreign direct investment demand function is modelled as follows:

$$\ln I_t = \beta_0 + \beta_1 \ln E_t + \beta_2 \ln E_t^2 + \beta_3 \ln TR_t + \beta_4 \ln TR_t^2 + \beta_5 \ln Y_t + \beta_6 \ln Y_t^2 + \beta_7 \ln F_t + \beta_8 \ln F_t^2 + \alpha_9 \ln EC_t + \mu_i \quad (3)$$

We expect the relationship between education and foreign direct investment is U-shaped if $\beta_1 < 0, \beta_2 > 0$ otherwise inverted-U shaped association. We can also build hypotheses of transportation infrastructure, economic growth and financial development with foreign direct investment whether the relationship between the variables is U-shaped or inverted-U shaped. For instance, $\beta_3 < 0, \beta_4 > 0$ ($\beta_5 < 0, \beta_6 > 0$) indicate U-shaped association between transportation infrastructure and foreign direct investment (economic growth and foreign direct investment) otherwise association between the variables is inverted-U shaped if $\beta_3 > 0, \beta_4 < 0$ ($\beta_5 > 0, \beta_6 < 0$). The non-linear relationship between financial development and foreign direct investment is inverted-U shaped if $\beta_7 > 0, \beta_8 < 0$ otherwise, it is U-shaped.

This study used annual data covering the period of 1965-2017. The data on foreign direct investment (net inflows as % of GDP), real GDP (constant LCU), domestic credit to the private sector as % of GDP and energy consumption (kg of oil equivalent) is collected from World Development Indicators (CD-ROM, 2018). We use overall index of transportation which is composite of passenger and freight transportation indices and data is collected from OECD data-stream (https://data.oecd.org/transport/infrastructure-investment.htm). We generate index of education using Principal Component Analysis (PCA) using primary school, secondary school and tertiary school enrollments and data is collected from World Development Indicators (CD-ROM, 2018)[1]. We transform all the variables into per capita unit except transportation infrastructure and education using total population.

IV. Methodological Framework

IV.I SOR Unit Root Test with Sharp and Smooth Breaks

Given that ignoring structural breaks can yield biased estimates, sharp and smooth structural breaks unit root test was established by Shahbaz, Omay and Roubaud (SOR, 2018) which is applied to inspect the integrating properties of the variables. The SOR is a nonlinear-unit root test

[1] The empirical results of PCA are available upon request from authors.

that accounts for sharp and smooth structural breaks in the time series. For example, classical unit root tests like Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) could overlook the existence of nonlinearity and structural breaks in the series which may be a possible cause of unit root problem. In such conditions, SOR unit root test is a more appropriate providing consistent and reliable empirical results. Following the empirical foundations placed by Leybourne et al. (1998), SOR test entails a two-segment approach as follows:

Segment-1. The controlled nonlinear optimization algorithm via Genetic is used [2]. Subsequently, the deterministic component of the preferred model is estimated, and its residuals are computed by using models A, B and C as given below:

$$\text{Model A}: \hat{\varepsilon}_t = y_t - \hat{\alpha}_1 - \hat{\alpha}_2 F_t\left(\hat{\gamma}, \hat{\tau}\right) \tag{4}$$

$$\text{Model B}: \hat{\varepsilon}_t = y_t - \hat{\alpha}_1 + \hat{\beta}_1 t - \hat{\alpha}_2 F_t\left(\hat{\gamma}, \hat{\tau}\right) \tag{5}$$

$$\text{Model C}: \hat{\varepsilon}_t = y_t - \hat{\alpha}_1 - \hat{\beta}_1 t - \hat{\alpha}_2 F_t\left(\hat{\gamma}, \hat{\tau}\right) - \hat{\beta}_2 F_t\left(\hat{\gamma}, \hat{\tau}\right) t \tag{6}$$

Segment 2. This comprises calculating the Enders and Lee (2012) test statistic, which is the *t*-ratio connected with $\hat{\phi}$ in the ordinary least squares regression:

$$\hat{\varepsilon}_t = d(t) + \phi_1 \hat{\varepsilon}_{t-1} + \upsilon_t \tag{7}$$

where $d(t)$ is a deterministic function of t, and υ_t is a stationary disturbance with variance σ^2. Equation-7 can directly be estimated to test the null hypothesis of a unit root (i.e. $\phi_1 = 1$) if the functional form of $d(t)$ is known. However, the form of $d(t)$ is unknown so testing could be difficult for $\phi_1 = 1$ if $d(t)$ is misspecified. Therefore, the approach used in this paper is based on the view that it is possible to approximate $d(t)$ using the Fourier expansion:

$$d(t) = \alpha_0 + \sum_{k=1}^{n} \alpha_k \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^{n} \beta_k \cos\left(\frac{2\pi kt}{T}\right), \; n \leq T/2 \qquad (8)$$

where the number of cumulative frequencies included in the approximation is represented by *n*, *k* depicts a specific frequency, and *T* presents the number of observations. Since we don't have a nonlinear trend for all the values of $\alpha_k = \beta_k = 0$, hence, the LNV (1998) specification becomes a special case. It is not advisable to use a large value of *n* as it can lead to a problem of over-fitting since the existence of many frequency components consumes the degrees of freedom. Several studies by Gallant (1981), Davies (1987), Gallant and Souza (1991), and Bierens (1997), empirically demonstrated that we can capture the important characteristics of an unknown functional form, with a small number of frequency components smooth break, when employing the Fourier approximation. Moreover, as it is important to accommodate the evolution of the nonlinear trend to be gradual, hence, *n* should be small. Finally, the testing equation can be presented in the following form:

$$\Delta\hat{\varepsilon}_t = \alpha_0 + \sum_{k=1}^{n} \alpha_k \sin\left(\frac{2\pi kt}{T}\right) + \sum_{k=1}^{n} \beta_k \cos\left(\frac{2\pi kt}{T}\right) + \phi_1 \hat{\varepsilon}_{t-1} + \sum_{i=1}^{p} \varphi_k \Delta\hat{\varepsilon}_{t-i} + \upsilon_t \qquad (9)$$

Usually the practice is to augment the dependent variables' lag value in testing the equation to adjust for any stationary dynamics in $\hat{\varepsilon}_t$. Concurrently, the value of the EL test statistic is shown as $s\tau_\alpha$ in Model A and is used to construct $\hat{\varepsilon}_t$, $s\tau_{\alpha(\beta)}$ when Model B is used, and $s\tau_{\alpha,\beta}$ in Model C.

The issue of whether a small number of frequency components can reproduce the types of breaks regularly detected in economic data is important when using SOR unit root test. To handle this, we start with a Fourier approximation employing a single frequency component depicted by *k*, while the amplitude and displacement of the sinusoidal component of the deterministic term is measured by α_k and β_k. Therefore, we can allow for multiple smooth breaks even with a single frequency $\mathrm{k} = 1$. The hypotheses of unit root testing based on models A, B, and C with the Fourier transformation is given in the following form:

$$H_0 : Unit\ Root \qquad (\text{Linear Nonstationary})$$
$$H_1 : Nonlinear\ Stationary \begin{pmatrix} \text{Nonlinear and Stationary around} \\ \text{simultenously changing sharp and smooth trend} \end{pmatrix} \tag{10}$$

We use the critical values of the SOR unit root test for Model A* provided by Shahbaz et al. (2018)[3] to test the hypothesis against the critical values.

IV.II. The Bootstrapping ARDL Bounds Testing Approach to Cointegration

The bootstrapping ARDL cointegration approach newly developed by McNown et al. (2018) is used to analyze the cointegration relationship between our variables. This approach takes care of the issue of weak size and power properties faced in the conventional ARDL approach (Pesaran and Shin 1999, Pesaran et al. 2001). The conventional unit root tests approaches which require two conditions for the identification of cointegration could be problematic due to the low explanatory and power properties they possess (see Goh et al. 2017). This shortcoming may be solved by employing the bootstrapping ARDL test of McNown et al. (2018) and using the new test statistics. Here, bootstrapping critical values have a larger size and power properties as also shown by the Monte Carlo simulations.

The bootstrapping ARDL bounds testing is also suitable for dynamic models with more than one explanatory variable. Another limitation of the critical value bounds, Pesaran et al. (2001), is that it is based on the assumption of exogeneity of the explanatory variables which does not hold mostly in the macroeconomic relationships. Succeeding Goh et al. (2017, p. 14), let us consider an ARDL (p, q, r), model with three variables:

$$y_t = \sum_{i=1}^{p} \alpha_i' y_{t-1} + \sum_{j=0}^{q} \beta_j' x_{t-j} + \sum_{k=0}^{r} \gamma_k' z_{t-k} + \sum_{i=1}^{s} \tau_l' D_{t,l} + \mu_t \tag{11}$$

where *i, j, k* and *l* denote the lags (*i* = 1, 2… p; *j* = 0, 1, 2, …, q; *k* = 0, 1, 2,…r; *l* = 0, 1, 2,…s; and *t* represents the time, yt is the response variable, and x_t and z_t are the explanatory variables. Furthermore, $D_{t,}$ is the dummy variable, β and γ represent the coefficients of the lagged explanatory variables, and τ is the coefficient of the dummy variable. Lastly, μ_t represents the error

term with zero mean and finite variance. This model can be stated in an error correction form as follows:

$$\Delta y_t = \varphi y_{t-1} + \gamma x_{t-1} + \psi z_{t-1} + \sum_{i=1}^{p-1} \lambda_i' \Delta y_{t-1} + \sum_{j=1}^{q-1} \delta' \Delta_j x_{t-j} + \sum_{k=1}^{r-1} \pi_k' z_{t-k} + \sum_{i=1}^{s} \omega_l' D_{t,l} + \varepsilon_t \quad (12)$$

In equation-12, $\phi = \sum_{i=1}^{p} \alpha_i$, $\gamma = \sum_{j=0}^{q} \beta_j$ and $\psi = \sum_{k=0}^{r} \gamma_k$. At this point, λi, δ_J, π_k, and ω_l account for the associated functions in equation-1. By transforming the vector autoregression in levels into its error-correction form, the derivation of equation-11 from equation-12 is estimated. Equation-11 can be estimated by using the constant term ($\tilde{c}$) in the unconditional model that can be stated as:

$$\Delta y_t = \tilde{c} + \tilde{\varphi} y_{t-1} + \tilde{\gamma} x_{t-1} + \tilde{\psi} z_{t-1} + \sum_{i=1}^{p-1} \tilde{\lambda}_i' \Delta y_{t-1} + \sum_{j=1}^{q-1} \tilde{\delta}_j' \Delta x_{t-j} + \sum_{k=1}^{r-1} \tilde{\pi}_k' z_{t-k} + \sum_{i=1}^{s} \tilde{\omega}_l' D_{t,l} + \varepsilon_t \quad (13)$$

It necessitates the rejection of all three-null hypothesis to approve cointegration among the variables y_t, x_t and z_t.

The hypothesis can be specified as:

i) The F1 test which is based on all of the relevant error-correction terms (H_0: $\phi = \gamma = \psi = 0$ against H_1: any of ϕ, γ, ψ are different from zero),

ii) The F2 test which is based on all of the explanatory variables terms (H_0: $\gamma = \psi = 0$ against H_1: either γ or ψ is different from zero),

iii) The T-test which is based on the lagged dependent variable (H_0: $\phi = 0$ against H_1: ϕ is different from zero).

Noting that using the bootstrapping ARDL approach proposed by McNown et al. (2018) provides critical values for all three tests, while in the traditional ARDL approach, only critical values of the bounds test for F1 and T-tests are generated, ignoring the test statistic for F2 test on the lagged explanatory variables. Therefore, in our paper, we employed the critical values tabulated by McNown et al. (2018) to provide empirically robust results.

V. Empirical Results

Table-1 shows descriptive statistics and pair-wise correlations. We find that financial development is more volatile compared to foreign direct investment. The volatility in energy consumption is lesser than volatility in transportation. Education volatility is larger as compared to economic growth. The results report by Jarque-Bera test confirm the normal distribution of the variables and inclines us for further empirical analysis. The correlation analysis reveals the positive correlation between education and foreign direct investment. Transportation and economic growth are positively linked with foreign direct investment. The correlation between financial development and foreign direct investment is negative. Energy consumption is positively linked with foreign direct investment. Transportation, economic growth, financial development and energy consumption are positively correlated with education. The positive correlation exists of economic growth, financial development and energy consumption with transportation. Financial development and energy consumption are positively linked to economic growth. The correlation between energy consumption and financial development is positive.

Table-1: Descriptive Statistics and Pair-wise Correlation

Variables	$\ln I_t$	$\ln E_t$	$\ln TR_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
Mean	1.2358	1.5494	1.2515	2.5811	3.0231	2.0429
Median	1.3693	1.5877	1.2688	2.5994	3.1375	2.0534
Maximum	1.8309	1.7547	1.3387	2.6630	3.3086	2.0919
Minimum	0.5724	1.1353	1.0581	2.4174	1.1336	1.8946
Std. Dev.	0.3889	0.1643	0.0735	0.0694	0.3026	0.0455
Skewness	-0.1976	-0.6163	-0.6822	-0.6438	-4.0377	-1.4982
Kurtosis	1.5166	2.2977	2.5571	2.3740	23.6657	4.8825
Jarque-Bera	2.4240	1.7445	1.7836	1.3768	2.6647	1.8531
Probability	0.2019	0.2263	0.2234	0.3319	0.1517	0.2756
$\ln I_t$	1.0000					
$\ln E_t$	0.1988	1.0000				

$\ln TR_t$	0.3396	0.3257	1.0000			
$\ln Y_t$	0.2799	0.4033	0.2155	1.0000		
$\ln F_t$	-0.1559	0.1569	0.1048	0.0770	1.0000	
$\ln EC_t$	0.0915	0.2583	0.5247	0.4493	0.2831	1.0000

Table-2: Unit Root Analysis

	ADF Test at Level		Kim-Perron ADF Test at Level		
Variable	T- Statistic	P. Value	T- Statistic	P. Value	Break Year
$\ln I_t$	-2.0527	0.5587	-4.5355	0.1196	2008
$\ln E_t$	-1.9957	0.5883	-4.1999	0.2597	1994
$\ln TR_t$	-2.0156	0.5792	-4.0692	0.3300	2007
$\ln Y_t$	-2.0886	0.5398	-3.6691	0.5845	2008
$\ln F_t$	-2.7733	0.1800	-3.2061	0.9120	1979
$\ln EC_t$	-2.4177	0.3664	-4.3722	0.1782	2008
SOR Sharp-Smooth Structural Break Test					
Variable	T-statistic	$\bar{a}_2$	T	$\bar{\gamma}$	α_k
$\ln I_t$	-2.7662	0.4276	1.5929	-29.1513	-0.8470
$\ln E_t$	-2.5377	5.1075	-6.1739	3.0244	1.6691
$\ln TR_t$	-4.5645	3.9302	0.4890	-0.3216	0.8527
$\ln Y_t$	-3.0380	9.6687	0.2035	6.0382	0.0261
$\ln F_t$	-1.4177	11.2108	-0.3732	42.7090	-28.7718
$\ln EC_t$	-3.0308	8.6555	-0.7267	6.2875	-1.8853
Note: The critical t-values at 1%, 5% and 10% are -5.415, -4.740 and -4.408, respectively.					

Further, we applied traditional and structural break unit root tests such as ADF (Dickey-Fuller, 1981) and Kim-Perron (2009) for examining stationarity properties of foreign direct investment, education, transportation, economic growth, financial development and energy consumption. The empirical results reported in Table-2 indicate that all the variables are found non-stationary at level confirmed by the ADF unit root test. We find that all the variables contain stationary property at first difference with intercept and trend. This confirms the unique order of integration i.e. I(1). The problem is that ADF unit root test is not from critic. This test produces ambiguous empirical results due to ignorance of structural breaks occurring in the time series which is main cause of unit root problem. This problem further weakens the explanatory of ADF test which inclines to reject null hypothesis when it seems true and vice versa. In doing so, we employ Kim and Perron (2009) unit root test which contains information of single unknown break in the series. The empirical results

are also reported in Table-2. We find that all the series are non-stationary at level with intercept and trend in the presence of structural breaks. The results show that structural breaks are around for the years of 1979, 1994 and 2008 for foreign direct investment, education, transportation, economic growth, financial development and energy consumption. After first differencing, variables are noted stationary. This confirms the results provided by ADF unit root test. This shows reliability of empirical findings. We further apply SOR unit root test developed by Shahbaz et al. (2018) which contains information of sharp and smooth structural breaks in the series. The results are shown in Table-2 (lower segment). We find that all the variables show non-stationarity but are found stationary at first difference in the presence of sharp and smooth structural breaks in the series[2]. The empirical findings show that all the variables are integrated at I(1). This underscores the reliability and robustness of empirical results.

[2] The first difference results are available upon request from authors.

Table-3: Bootstrap ARDL Cointegration Analysis

Bounds Testing Approach to Cointegration						Diagnostic tests			
Estimated Models	Lag Length	Break Year	F_{PSS}	T_{DV}	T_{IV}	$\bar{R}^2$	$Q-stat$	$LM(2)$	JB
$I_t = f(E_t, TR_t, Y_t, F_t, EC_t)$	2, 1, 2, 2, 2, 1, 2	2008	23.312*	-12.549*	7.983*	0.8395	9.081	0.9081	0.2042
$E_t = f(I_t, TR_t, Y_t, F_t, EC_t)$	2, 2, 2, 1, 1, 2	1994	2.050	-1.001	-1.110	0.7406	1.0402	1.8510	0.3474
$TR_t = f(I_t, E_t, Y_t, F_t, EC_t)$	2, 1, 2, 1, 2, 1, 2	2007	56.030*	-4.958*	-3.806**	0.6760	9.1510	2.0102	1.2040
$Y_t = f(I_t, E_t, TR_t, F_t, EC_t)$	2, 2, 1, 1, 1, 2, 1	2008	30.180*	-2.904**	-2.585**	0.7232	9.1102	1.3994	0.2045
$F_t = f(I_t, E_t, TR_t, Y_t, EC_t)$	2, 2, 2, 1, 2, 2, 1	1979	3.238	-1.515	-0.609	0.4080	8.1335	4.6200	0.7237
$EC_t = f(I_t, E_t, TR_t, Y_t, F_t)$	2, 1, 2, 2, 2, 1, 2	2008	29.367*	-7.475*	-7.444*	0.8575	7.867	4.5007	2.1715

Note: The asterisks * and ** denote significance at the 1% and 5% levels, respectively, based on the critical values generated by the bootstrap procedure. The optimal lag length is determined by AIC. F_{PSS} is the F-statistic based on the asymptotic critical bounds, which is generated from the bootstrap method. T_{DV} is the t-statistic for the dependent variable, T_{IV} is the t-statistic for the independent variables, LM is the Langrage Multiplier test and JB is the Jarque-Bera test.

After having a unique order of integration, we examine long-run cointegration relationship between the variables by applying the bootstrapping ARDL bounds testing approach if either variable has cointegration. This test is more appropriate compared to conventional bounds testing approach to cointegration. This test applies the joint F-test on all the lagged level variables and T-test on dependent variables in lagged level form. The T-test (new test) is also applied on the lagged level independent variables for making decision whether cointegration is present between the variables. This indicates the superiority of bootstrapping ARDL bounds testing approach. Following bootstrapped ARDL cointegration framework, F-value and T-value are bootstrapped for investigating the presence of cointegration between the variables. We have reported the results of the bootstrapping ARDL bounds testing in Table-3. We find that the null hypothesis of no cointegration is rejected by the F-test and T-test on the lagged level of dependent variable as we treated education, transportation infrastructure, economic growth, foreign direct investment as explanatory variables. We have noted that alternate hypothesis is also accepted as we applied T-test on the lagged dependent variables. This shows the presence of cointegration between the variables as we applied the joint F-test, the T-test on the lagged dependent variable and the T-test on the lagged independent variables. Our empirical evidence confirms the cointegration as we used foreign direct investment, transportation infrastructure, economic growth and energy consumption as dependent variables. The cointegration is not confirmed by the joint F-test, the T-test on the lagged dependent and the T-test on the lagged independent variables as we treated education and financial development as dependent variables. Overall, our empirical results indicate that foreign direct investment, education, transportation infrastructure, economic growth, financial development and energy consumption are counteracted for the period of 1965-2017.

The empirical results for long-run impact of education, transportation, economic growth, financial development and energy consumption on foreign direct investment are reported in Table-4. We find that education is positively linked with foreign direct investment. This implies that education plays an important role in attracting foreign direct inflows. Keeping other things constant, a 1% increase in education leads foreign direct investment by 0.5854%. This empirical evidence is similar with Xu (2000), Zhang (2001), Chang et al. (2009), and Brooks et al. (2010) who insisted that quality of education is one of the important determinants for the location of FDI flows. On contrary, Root and Ahmed (1978), Narula (1996), Cheng and Kwan (2000), Hong (2008), Cleeve et al. (2015) noted insignificant role of education in determining foreign direct

investment in recipient country. Transportation infrastructure adds to foreign direct investment significantly. All else equal, 0.3950% of foreign direct investment is led by 1% increase in transportation infrastructure. Similarly, Goodspeed et al. (2007), Yol and Teng (2009), Khadaroo and Seetanah (2010), Akpan et al. (2014) and Ahmad et al. (2015) also reported that quality of transport infrastructure is an import factor which determines foreign direct investment in recipient country. Economic growth and foreign direct investment are positively linked at 1% significance level. It implies that a 1% increase in economic growth may lead foreign direct investment by 0.1057% keeping all else the same. These empirical results are consistent with Asheghian, (2016) who indicated that rise in economic growth is necessary condition to attract foreign direct investment. The effect of financial development on foreign direct investment is negative and significant. This shows that financial development is declining foreign direct investment. Keeping other factors constant, 1% increase in financial development lowers foreign direct investment by 0.0315%. These empirical findings are contrary to Najilee and Al Nasser (2015) and Bayar and Gavriletea (2018) who note that financial development has long-run positive effect on foreign direct investment in case of 11 Latin American and CEEU countries. Furthermore, Claessens et al. (2001), Dutta and Roy (2008), Abzari et al. (2011), Bayar and Ozel (2014), Sahin and Ege (2015), Bayar and Omer (2016) and Enisan (2017) report the neutral effect of financial development on foreign direct investment. Electricity consumption increases foreign direct investment significantly at 1% level of significance. It implies that energy supply is also an important factor like transportation infrastructure for foreigners to make investment in France. A 0.2449% of foreign direct investment is increased due to 1% rise in electricity consumption. This empirical evidence is contradictory with Leitão (2015) who reported energy consumption as main determinant of foreign direct investment in European Union including France.

Table-4: Long Run Analysis

Dependent Variable = $\ln I_t$				
Variables	Coefficient	Prob. Value	Coefficient	Prob. Value
Constant	-9.8567*	0.0000	166.5999*	0.0003
$\ln E_t$	0.5854*	0.0023	-16.0268*	0.0009
$\ln E_t^2$	….	….	4.8660*	0.0013
$\ln TR_t$	0.3950*	0.0000	-2.6500**	0.0139
$\ln TR_t^2$	….	….	8.7039**	0.0796
$\ln Y_t$	0.1057*	0.0000	-15.5061*	0.0002

$\ln Y_t^2$	….	….	2.9698*	0.0003
$\ln F_t$	-0.0315*	0.0028	-0.4331***	0.0585
$\ln F_t^2$	….	….	0.0947***	0.0759
$\ln EC_t$	0.2449*	0.0000	0.2319*	0.0028
D_{1986}	0.0995*	0.0000	0.0717**	0.0451
R^2	0.9037		0.9101	
Adj- R^2	0.8969		0.8625	
F-Statistic	5.6208*		6.8091*	
Durbin Watson	1.7603		1.8675	
Stability Test				
Test	F. Statistic	Prob. Value	F. Statistic	Prob. Value
χ^2_{Normal}	1.76633	0.4140	3.2778	0.1941
χ^2_{serial}	0.4864	0.9016	0.3876	0.9312
χ^2_{ARCH}	0.2929	0.9605	0.2805	0.9452
χ^2_{Hetero}	0.4132	0.9200	0.4044	0.9289
χ^2_{Remsay}	0.7195	0.4727	0.8179	0.4608
CUSUM	Stable		Stable	
CUSUMsq	Stable		Stable	
Note: * and ** show significance at 1% and 5% levels respectively.				

In order to examine nonlinear effect of education, transportation infrastructure, economic growth and financial development on foreign direct investment, we included squared terms of education, transportation infrastructure, economic growth and financial development into foreign direct investment demand function for French economy. We found that the relationship between education and foreign direct investment is U-shaped and it is statistically significant at 1%. This implies that foreign direct investment is negatively linked with education (maybe mismatch of education with the requirements of foreign investors) but after a threshold level of quality education, education accompanies foreign direct investment. Similarly, linear and squared terms of transportation infrastructure are negatively and positively linked with foreign direct investment at 5% significance level. This shows the presence of U-shaped relationship between transportation infrastructure and foreign direct investment. This reveals that initially transportation infrastructure is negatively associated with foreign direct investment but after certain level of transportation infrastructure development, foreign direct investment increases. The relationship between economic growth and foreign direct investment is U-shaped. We may note that after threshold level of real GDP per capita, foreign direct investment is increased and on contrary, foreign direct investment is negatively linked with economic growth initially. Lastly, linear and squared terms

of financial development are negatively and positively linked with foreign direct investment. This shows that initially, financial development declines foreign direct investment but after certain level, financial development accompanies foreign direct investment i.e. U-shaped relationship.

Additionally, linear and nonlinear long-run models have overall statistically significance and R^2 of 0.9037 and 0.9101 respectively. Both models have normal distribution and the absence of serial correlation is confirmed. There is no presence of auto-conditional and white heteroscedasticity. The linear and nonlinear models are well designed confirmed by Ramsey reset test. The CUSUM and CUSUMsq tests also confirm the reliability of long run results.

Table-5: Short Run Analysis

Dependent Variable = $\Delta \ln I_t$				
Variables	Coefficient	Std. Error	T-Statistic	Prob. Value
Constant	-0.0076***	0.0045	-1.6737	0.0960
$\Delta \ln E_t$	0.1935*	0.6419	3.0144	0.0030
$\Delta \ln TR_t$	0.5495*	1.5398	3.5689	0.0005
$\Delta \ln Y_t$	-0.1752	2.8898	-0.0606	0.9517
$\Delta \ln F_t$	-0.0475*	0.0154	-3.0719	0.0025
$\Delta \ln EC_t$	0.3737	0.8106	0.4610	0.6454
D_{1986}	0.0053	0.0044	1.1810	0.2392
ECM_{t-1}	-0.1081*	0.0306	-3.5302	0.0005
R^2	0.4715			
Adj- R^2	0.3883			
F-Statistic	5.0201*			
Durbin Watson	1.9496			
Stability Test				
Test	F. Statistic	Prob. Value		
χ^2_{Normal}	0.6351	0.5708		
χ^2_{serial}	0.4849	0.6007		
χ^2_{ARCH}	1.2617	0.2628		
χ^2_{Hetero}	0.1511	0.9717		
χ^2_{Remsay}	0.8017	0.4238		
CUSUM	Stable			
CUSUMsq	Stable			
Note: * and ** show significance at 1% and 5% levels respectively.				

In the short run, education has positive and statistically significant effect on foreign direct investment (see Table 5). Transportation infrastructure significantly contributes to foreign direct

investment. The impact of economic growth on foreign direct investment is negative but it is insignificant. Financial development significantly declines foreign direct investment. Electricity consumption affects foreign direct investment positively but insignificantly. We further note that coefficient of ECM_{t-1} term is negative and statistically significant at 1% level of significance. This significance of ECM_{t-1} shows the speed of adjustment from short-run towards long-run equilibrium path for French economy by employing foreign direct investment demand function. The estimate of lagged error term is 0.1081 which confirms that changes in short-run are corrected by 10.81% every year. This indicates that adjustments in short-run will take 9 years and 3 months to attain the long-run equilibrium path. The short-run model contains R^2 equal to 0.4715 and model is overall statistically significant at 1%. The diagnostic analysis reveals the absence of serial correlation and normal distribution is also found for short-run model. The absence of autoregressive conditional heteroscedasticity is confirmed. The white heteroscedasticity is not present and specification of short-run model is well designed.

The VECM Granger causality analysis is reported in Table-5. We find that education causes foreign direct investment but similar is not true in the long run. The feedback effect is found between transportation infrastructure and foreign direct investment. Transport infrastructure causes economic growth and similarly, economic growth causes transportation infrastructure. Financial development causes foreign direct investment, education and economic growth. The bidirectional causality exists between electricity consumption and foreign direct investment. Electricity consumption does not cause financial development but financial development causes electricity consumption. The unidirectional causality is found running from electricity consumption to education. Economic growth causes electricity consumption and in resulting, electricity consumption causes economic growth. The unidirectional causal relationship exists running from education to economic growth. Electricity consumption causes transportation infrastructure and in resulting, transportation infrastructure causes electricity consumption. The neutral effect also exists between financial development and education.

In the short run, we find that transportation infrastructure causes foreign direct investment and in result, foreign direct investment causes transportation infrastructure. The unidirectional causality also exists running from education and financial development to transportation infrastructure.

Economic growth is caused by transportation infrastructure and transportation infrastructure is caused by economic growth in Granger sense. Education causes financial development and electricity consumption is caused by transportation infrastructure in Granger sense. Furthermore, long-run and short-run joint causality results confirm the short-run and long-run causality empirical analysis.

Table-6: VECM Granger Causality Analysis

Direction of Causality								
Variables	**Short Run**							**Long Run**
	$\Delta \ln I_t$	$\Delta \ln E_t$	$\Delta \ln TR_t$	$\Delta \ln Y_t$	$\Delta \ln F_t$	$\Delta \ln EC_t$	**Break Year**	ECM_{t-1}
$\Delta \ln I_t$	….	0.9097 [0.4114]	9.9656** [0.0123]	0.5698 [0.5702]	0.0865 [0.9173]	2.0428 [0.1440]	2008	-0.3226** [-2.3289]
$\Delta \ln E_t$	0.8372 [0.4414]	….	1.7210 [0.1937]	1.2400 [0.3018]	1.8779 [0.1805]	0.7168 [0.4635]	1994	-0.0931 [-1.3334]
$\Delta \ln TR_t$	3.4835*** [0.0980]	2.8850*** [0.0692]	….	2.8192*** [0.0732]	27.3371* [0.0000]	0.0952 [0.9094]	2007	-0.3091* [2.9087]
$\Delta \ln Y_t$	1.9848 [0.1526]	0.1636 [0.8457]	18.2945* [0.0000]	….	1.0190 [0.9812]	0.2205 [0.8032]	2008	-0.0740** [-2.2502]
$\Delta \ln F_t$	0.0351 [0.9545]	4.6352** [0.0160]	0.5248 [0.5962]	0.0260 [0.9743]	….	2.2458 [0.1206]	1979	-0.4136 [-1.0987]
$\Delta \ln EC_t$	0.4111 [0.6660]	0.7536 [0.4781]	4.0041** [0.0272]	0.1657 [0.8479]	2.0880 [0.1391]	….	2008	-0.2067*** [-1.7072]
Long Run-and-Short Run Joint Causality								
$\Delta \ln I_t$	….	2.8471** [0.0507]	4.0617** [0.0136]	4.1656** [0.0129)	2.2602*** [0.0975]	2.4268*** [0.0809]	2008	
$\Delta \ln E_t$	….	….	….	….	….	….	1994	
$\Delta \ln TR_t$	2.9404** [0.0505]	4.3041** [0.0211]	….	11.7080* [0.0000]	2.8410** [0.0509]	3.0621** [0.0487]	2007	
$\Delta \ln Y_t$	2.9303** [0.0505]	2.8705** [0.0485]	12.2992* [0.0000]	….	3.0171** [0.0387]	3.1231** [0.0365]	2008	
$\Delta \ln F_t$	….	….	….	….	….	….	1979	
$\Delta \ln EC_t$	5.1107** [0.0292]	9.1303* [0.0048]	2.7691*** [0.0561]	9.0906* [0.0051]	5.2010** [0.0265]	….	2008	
Note: * and ** indicate the significance at 1% and 5% levels respectively.								

To examine the robustness of causality analysis, we apply innovative accounting approach which is a combination of variance decomposition analysis and impulse response function. The VECM Granger causality tests provide causal relationship between the variables within selected sample period. The variance decomposition analysis produces response of dependent variable due to shocks in impendent variable(s). The impulse response function is mirror of variance decomposition and shows the direction of response due to shocks. Table-7 reports results of variance decomposition. We find that 48% in foreign direct investment is contributed by its own innovative shocks. Education contributes to foreign direct investment by 16.37%. A minimal contribution to foreign direct investment by transportation, economic growth and financial development is 9.73%, 1.80% and 1.87% respectively. Electricity consumption contributes to foreign direct investment by 21.86%. A 22.56% of education is contributed by electricity consumption. The contribution of foreign direct investment, transportation infrastructure, economic growth and financial development is minimal i.e. 7.30%, 1.89%, 5.02% and 1.67% respectively. Education and electricity consumption contribute to transportation infrastructure significantly i.e. 33.05% and 28.04% respectively. The contribution of economic growth and financial development to transportation infrastructure is minimal. Foreign direct investment contributes to transportation infrastructure is 14.04%.

Table-7: Variance Decomposition Analysis

Variance Decomposition of $\ln I_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	100.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	83.4508	0.8581	12.4089	0.7617	2.1237	0.3966
3	75.0840	2.4776	14.4124	0.9201	2.6839	4.4217
4	70.2779	4.6041	14.1612	0.8785	2.7401	7.3379
5	66.1267	7.0758	13.2128	0.8220	2.6567	10.1057
6	62.2876	9.5308	12.3268	0.7711	2.4767	12.6068
7	58.9332	11.6871	11.5580	0.7330	2.3093	14.7792
8	56.1437	13.3890	10.9451	0.7197	2.1806	16.6217
9	53.8986	14.6228	10.4816	0.7432	2.0852	18.1683
10	52.1591	15.4485	10.1486	0.8133	2.0147	19.4156
11	50.8499	15.9536	9.9247	0.9358	1.9623	20.3733
12	49.8867	16.2287	9.7900	1.1087	1.9243	21.0613
13	49.1919	16.3529	9.7251	1.3215	1.8983	21.5101
14	48.6964	16.3872	9.7125	1.5593	1.8821	21.7623
15	48.3421	16.3744	9.7366	1.8052	1.8732	21.8682

Variance Decomposition of $\ln E_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	3.7687	96.2313	0.0000	0.0000	0.0000	0.0000
2	4.2431	91.2634	0.2816	0.1721	0.4010	3.6385
3	3.8675	86.4082	0.7580	0.4552	2.1610	6.3499
4	5.7175	82.5562	0.5126	0.5931	2.7316	7.8887
5	7.1846	79.2296	0.4167	0.4639	2.6039	10.1010
6	7.9426	76.0162	0.4101	0.3824	2.5311	12.7172
7	8.3787	73.2454	0.4272	0.4197	2.3858	15.1430
8	8.5084	70.8258	0.4844	0.6233	2.2083	17.3496
9	8.4197	68.7283	0.5871	0.9902	2.0538	19.2207
10	8.2281	66.9492	0.7267	1.5003	1.9277	20.6677
11	7.9995	65.4476	0.9047	2.1287	1.8315	21.6876
12	7.7768	64.1883	1.1190	2.8365	1.7630	22.3161
13	7.5842	63.1391	1.3616	3.5809	1.7174	22.6165
14	7.4283	62.2654	1.6234	4.3215	1.6891	22.6720
15	7.3058	61.5365	1.8939	5.0226	1.6723	22.5686
Variance Decomposition of $\ln T_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	25.2099	0.3779	74.4121	0.0000	0.0000	0.0000
2	21.6667	0.9772	75.4311	0.0321	0.7549	1.1377
3	21.5833	3.1159	69.7165	0.0244	2.0645	3.4950
4	21.2944	7.30065	63.0503	0.0877	2.1408	6.1259
5	21.0017	12.9311	55.1533	0.2879	1.8655	8.7602
6	20.3687	18.7072	47.4738	0.4866	1.5798	11.3836
7	19.4535	23.6783	40.8536	0.6052	1.3771	14.0320
8	18.4862	27.4584	35.5845	0.6303	1.2579	16.5825
9	17.5614	30.0765	31.5867	0.5894	1.1819	19.0038
10	16.7134	31.7423	28.6364	0.5341	1.1251	21.2485
11	15.9643	32.6982	26.5017	0.5106	1.0753	23.2497
12	15.3222	33.1574	24.9865	0.5506	1.0294	24.9537
13	14.7896	33.2904	23.9364	0.6695	0.9894	26.3245
14	14.3653	33.2267	23.2326	0.8672	0.9577	27.3501
15	14.0426	33.0594	22.7832	1.1317	0.9358	28.0470
Variance Decomposition of $\ln Y_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	18.1429	1.8789	49.0840	30.8941	0.0000	0.0000
2	16.0724	2.2059	54.6536	26.0164	0.7590	0.2925
3	14.2379	3.2439	54.6132	25.3575	2.0089	0.5383
4	13.4127	5.2430	53.2606	24.9916	2.3473	0.7444
5	13.2305	8.3011	51.0762	24.2426	2.3004	0.8489
6	13.2987	12.1892	48.2583	23.1456	2.1239	0.9841
7	13.4370	16.4880	45.1171	21.8279	1.9167	1.2131

8	13.6044	20.7373	41.8913	20.4564	1.7433	1.5671
9	13.7500	24.5783	38.8222	19.1735	1.6117	2.0640
10	13.8354	27.8218	36.0696	18.0664	1.5128	2.6937
11	13.8489	30.4184	33.7050	17.1786	1.4345	3.4145
12	13.7912	32.4077	31.7391	16.5218	1.3678	4.1721
13	13.6726	33.8739	30.1466	16.0865	1.3088	4.9115
14	13.5098	34.9151	28.8841	15.8501	1.2558	5.5848
15	13.3208	35.6255	27.9027	15.7835	1.2089	6.1583
Variance Decomposition of $\ln F_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	1.3139	6.0050	9.2894	4.2972	79.0943	0.0000
2	7.7413	5.7004	10.1059	4.6977	70.9570	0.7974
3	7.5092	5.4330	11.8020	5.2130	68.2159	1.8266
4	7.3391	5.3194	12.5492	5.2114	66.9344	2.6463
5	7.3959	5.3649	12.5855	5.3233	66.5951	2.7350
6	7.3174	5.4165	12.7346	5.5492	66.1173	2.8646
7	7.3025	5.4717	12.8748	5.6665	65.7799	2.9044
8	7.2986	5.5201	12.9220	5.7346	65.6278	2.8966
9	7.3046	5.5474	12.9603	5.7792	65.5158	2.8923
10	7.3125	5.5573	12.9898	5.7987	65.4410	2.9003
11	7.3135	5.5573	13.0060	5.8053	65.3968	2.9208
12	7.3112	5.5547	13.0162	5.8065	65.3681	2.9430
13	7.3090	5.5563	13.0218	5.8054	65.3468	2.9604
14	7.3095	5.5662	13.0230	5.8037	65.3267	2.9707
15	7.3139	5.5861	13.0211	5.8016	65.3031	2.9739
Variance Decomposition of $\ln EC_t$						
Period	$\ln I_t$	$\ln E_t$	$\ln T_t$	$\ln Y_t$	$\ln F_t$	$\ln EC_t$
1	0.6639	1.2286	28.2968	2.6410	1.6230	65.5464
2	0.4132	1.1246	37.0398	2.3425	1.5892	57.4905
3	0.3851	1.3017	34.0341	2.0696	2.2343	59.9749
4	0.3837	1.7894	32.2567	2.1215	2.2408	61.2076
5	0.3498	2.6259	30.3174	2.3095	2.1869	62.2102
6	0.3227	3.6904	28.5970	2.5018	2.0844	62.8034
7	0.3068	4.8682	27.0510	2.6760	1.9589	63.1388
8	0.3064	6.0171	25.7132	2.8000	1.8531	63.3100
9	0.3155	7.0318	24.5899	2.8562	1.7700	63.4363
10	0.3257	7.8558	23.6745	2.8574	1.7065	63.5797
11	0.3320	8.4738	22.9510	2.8227	1.6575	63.7626
12	0.3321	8.9002	22.3966	2.7720	1.6191	63.9797
13	0.3278	9.1671	21.9855	2.7223	1.5894	64.2077
14	0.3232	9.3136	21.6919	2.6846	1.5672	64.4191
15	0.3226	9.3779	21.4913	2.6644	1.5517	64.5918

Education and transportation infrastructure contribute to economic growth by 35.62% and 27.90% respectively. A 13.32%, 1.20% and 6.15% is the contribution of foreign direct investment, financial development and electricity consumption. Financial development is significantly contributed by its own innovative shocks. Foreign direct investment, education, transportation infrastructure, economic growth and electricity consumption contribute to financial development very minimally. A 21.49% contribution to electricity consumption is by transportation infrastructure; 0.32%, 9.37%, 2.66% and 1.55% by foreign direct investment, education, economic growth and financial development respectively.

Figure-1: Impulse Response Function

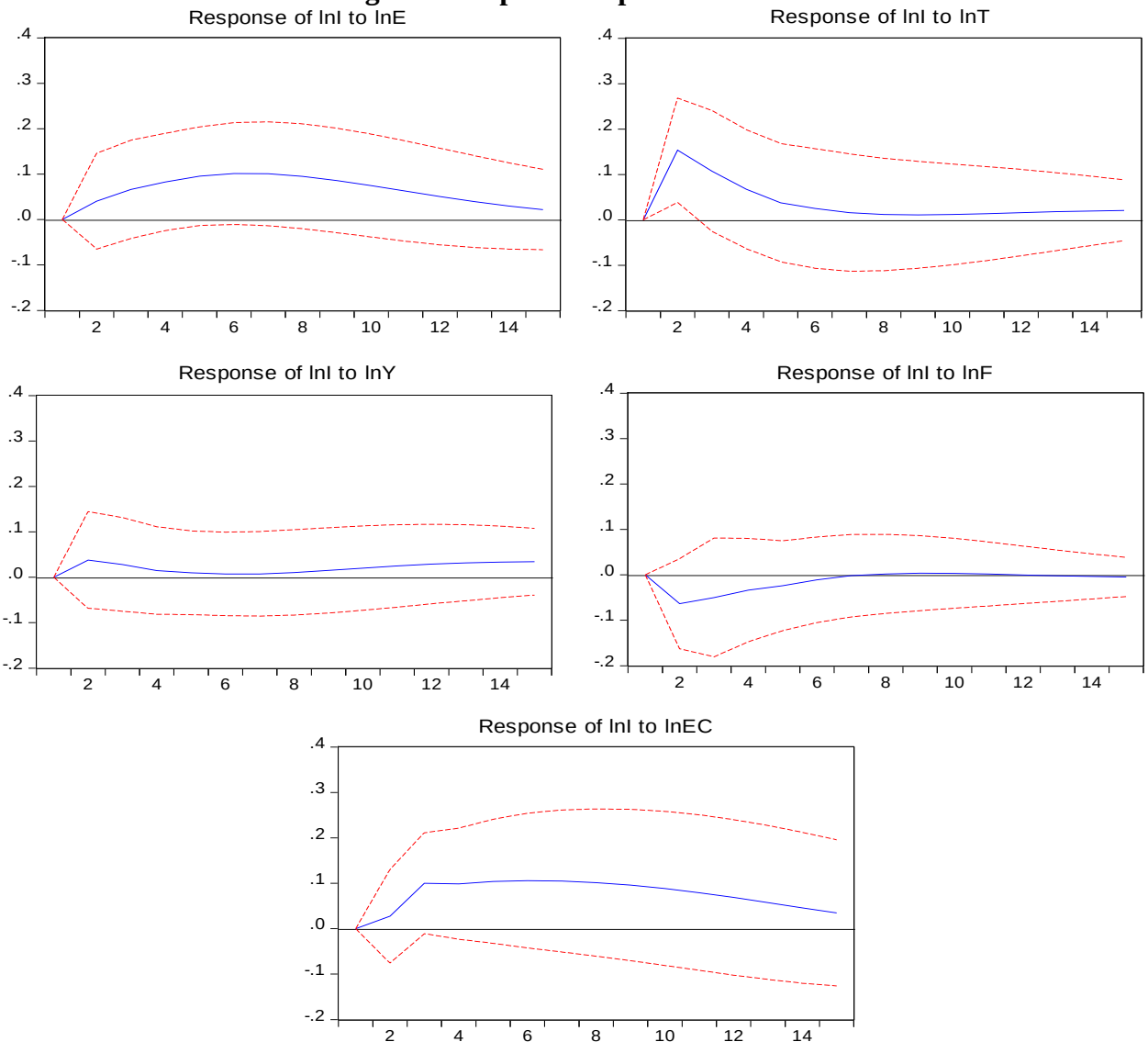

Figure-1 shows results of impulse response function. We note that education positively contributes to foreign direct investment. Foreign direct investment responds positively due to forecast error stems in transportation infrastructure. The response of foreign direct investment due to forecast error occurring in economic growth. Financial development contributes to foreign direct investment negatively. The response of foreign direct investment to forecast error in electricity consumption is positive. These empirical findings are similar to long-run analysis.

VI. Conclusion and Policy Implications

This study examined the effects of education and transportation infrastructure on foreign direct investment by considering economic growth, financial development and energy consumption in foreign direct investment demand function for the French economy for the period of 1965-2017. We have applied unit root tests containing information of sharp and smooth structural breaks in order to examine stationarity properties of the variables. The bootstrapping ARDL bounds testing approach is applied to test the presence of cointegration between the variables. The direction of the causal relationship between foreign direct investment and its determinants is investigated by applying a VECM Granger causality approach.

Our empirical results indicate the presence of cointegration between foreign direct investment and it's under analysis determinants. Specifically, education and transportation infrastructure have a positive effect on foreign direct investment. In the policy setting, this implies that the investment in education and transportation infrastructure in France can attribute to increasing in the much need foreign direct investment for its economy. Important of the foreign direct investment and economic growth nexus is also manifested in our analysis as it showed that the relationship between economic growth and foreign direct investment is positive. Concomitantly, in the public and economic policy setting, it is vital to account for the resource allocation to the education and transportation infrastructure in an effort to enhance the economic growth and foreign direct investment in France. Interestingly, our results also showed that financial development impedes foreign direct investment. This is an important finding in terms of the role of finance, particularly the policy and process of credit creation and its consequences for the real economy via foreign direct investment channel. Perhaps, the credit to private sector has an element of crowding out of foreign direct investment. This implies that in policy setting, the allocation of resources and credit

shall facilitate more efficient sector of the economy and investment, irrespective of foreign or domestic. Although the results suggest that there are definitely unintended consequences for foreign direct investment. In terms of energy consumption, our results suggests that it promotes foreign direct investment. This nexus is important in the economic as well as ecological context. Especially, it is vital that in policy formulation, the use of renewable energy is promoted by allocating more resources to it. This will enhance foreign direct investment without impeding on environment.

The empirical analysis also accounted for the nonlinearities in the relationship among the variable of interest. The results suggest that the nonlinear relationship of education, transportation infrastructure, economic growth and financial development is U-shaped with foreign direct investment. These findings are important in terms of the contrast and tradeoffs between the long and short implication of each factor. Putting simply, it implied although some variables may have short-term negative effects on the foreign direct investment, in the long run, they may act more benevolently. This aspect was prima facie evident in the effects of education and transportation infrastructure as the foreign direct investment is negatively linked with education but after a threshold level of quality education, education accompanies foreign direct investment. Similarly, linear and squared terms of transportation infrastructure are negatively and positively linked with foreign direct investment i.e. U-shaped. In the policy context, this implies that the positive role of education and transportation infrastructure in promoting foreign direct investment is expected and hence treated as a long-term policy objective. Similarly, the relationship between economic growth and foreign direct investment is U-shaped. It suggests that where the foreign direct investment is negatively linked with economic growth initially, after a threshold level of real GDP per capita, foreign direct investment is increased. However, the empirical results on the linear and quadratic terms of financial development lead us to conclude on a positive and negative linkage with foreign direct investment. Concomitantly, on the basis of empirical findings we infer that that initially, financial development declines foreign direct investment but after a certain level, financial development accompanies foreign direct investment. This finding as important policy context. Specifically, it implies that in the long run, the financial development can facilitate foreign direct investment and hence the long-term role of finance is important in encouraging foreign direct investment.

In order to account for the feedback effects among the variables of interest, we performed the causality analysis. The key findings lead us to conclude that a unidirectional causal relationship exists, running from education and financial development to foreign direct investment. The finding is intuitive as a financially developed economy is expected to encourage foreign direct investment. We also conclude on the existence of feedback effect between transportation infrastructure, economic growth and foreign direct investment. Intuitively, where the transportation infrastructure and economic growth facilitates foreign direct investment, it is cogent to expect that the later will enhance the economic growth and lead to the development of transportation infrastructure. Concomitantly it is a win-win senior. On the nexus between energy consumption and foreign direct investment, we conclude on the bi-directional causality. Energy consumption causes foreign direct investment and in return, foreign direct investment causes energy consumption. Though this is a cogent and intuitive conclusion, it has important ecological and policy implication. Specifically, considering the strong nexus between energy consumption and foreign direct investment, it is vital to allocate resources to renewable and environmentally friendly sources of energy which may enhance direct investment without many ecological consequences. Overarching, our findings provide an analytical foundation for the evaluation of the country policy and institutional factors that contribute to making France more attractive to foreign investors. In line with these findings and subsequent conclusion, the analysis provides guidance on which major determinants of FDI a strong emphasis should be placed by policymakers, such as education and transportation infrastructure, financial development and energy consumption. A key aspect of the French government policy should be education and energy consumption as they are found to be a significant prerequisite for FDI to have a positive effect on economic growth. Yet, in the broader picture, it is vital to account for the ecological aspect through the increased energy consumption. Perhaps, these are the critical aspects for evidence-based policymaking. In this study, we have been particularly focusing on the French economy for the reasons we discussed in the earlier part of this treatise. However, the same framework of analysis can be extended to other economics, including both developed and developing countries which seek to enhance and facilitate the foreign direct investment.

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