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What Determines the Financial and Insurance Services Exports: The Case of the United Kingdom

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Abstract: The financial sector is a very basic pillar of the international financial system. Almost all countries of the present international economic system participate in international financial services. Today's era, due to intense globalization, constant capital movements, continuous commercial integration and the ever-increasing financial interconnection, have made financial and insurance services an essential element of the present reality. The financial sector is an industry that is very 'sensitive' to the macroeconomic and political stability of countries. This means that countries that are considered unstable cannot have a positive impact on their financial activities. One country that has a strong position in the financial sector is the United Kingdom (UK). The question that can be asked is this: what are the factors that determine the optimal functioning of financial and insurance activities. One answer could be the strong financial institutions of a country. Another answer is the corruption indicator. Or even the existence of intervention by the state apparatus in the financial functions. Of course, these factors must have tangible proof of the functioning of the economy. State intervention, for example, does not entirely mean that it is dysfunctional. This study will seek to create a framework for the analysis of financial services factors. The methodology applied is The Multiple Linear Regression - Ordinary Least Squares (OLS).

Keywords: Financial - Insurance Services, Exports, OLS.

1. Introduction

Financial services are essential in modern times. Essentially it can be said that they are the basis on which the modern global economic system has been built. Financial and Insurance services make up the largest proportion of tradable services according to Rickards (2019). Moreover, he says that the opening up of financial sectors to international competition, the outsourcing of certain financial services and the growth of internationally active banks are some of the reasons that have led to a rise in Financial and Insurance Services. Continuing, he says that the countries that have a strong presence in the Financial and Insurance Services are Singapore, Switzerland, the United Kingdom, the United States and the Euro Area. He also mentions that the United Kingdom is one of the largest exporters of financial services and that

the United Kingdom is the largest foreign exchange market in the world and provides the most cross-border bank lending.

It is interesting to present some economic data[1] regarding the UK economy. Figure 1. shows the Exports Of Goods and Services (% of GDP) and the Real Effective Exchange Rate (REER) (2010=100) of the United Kingdom for the period 1990-2020. Figure 2. shows the Inflation (annual %) and the GDP Growth (annual %) of the United Kingdom for the period 1990-2020.

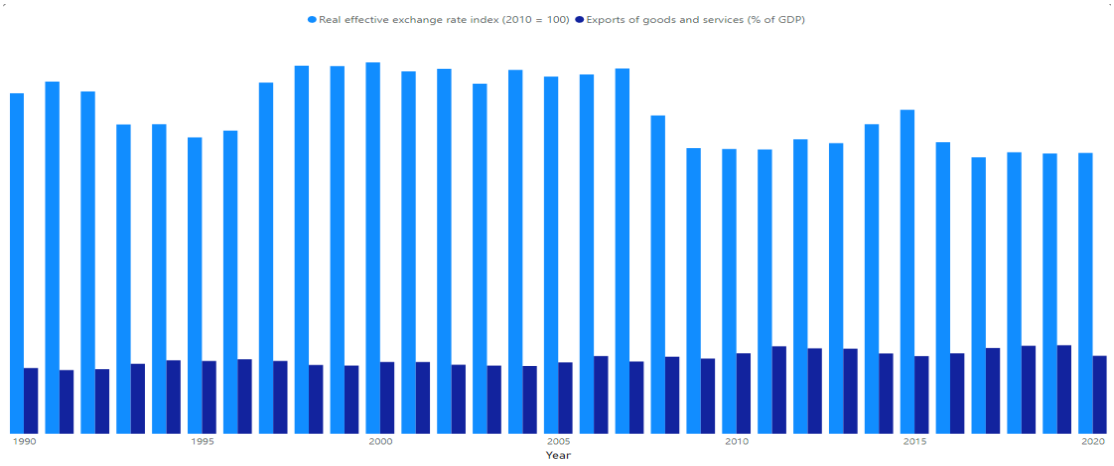

Figure 1. The Exports of Goods and Services (% of GDP) and the Real Effective Exchange Rate (2010=100) of United Kingdom for the period 1990-2020 (World Bank, 2021).

The average of exports of goods and services is 26.43 and the variation is 6.24. The average of Real Effective Exchange Rate is the value of 113.69 and the variance is 139.39. While the proportion of UK exports does not fluctuate in a large proportion, the trade competitiveness has high variation.

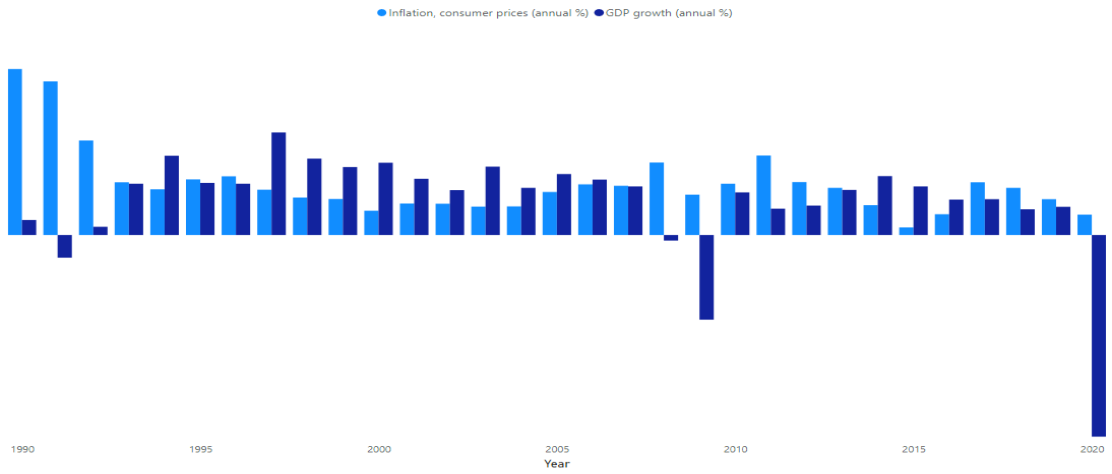

Figure 2. The Inflation (annual %) and the GDP Growth (annual %) of United Kingdom for the period 1990-2020 (World Bank, 2021).

[1] See Appendix.

The average of GDP Growth is 1.60 and the variation is 7.00. The average of Inflation is the value of 2.49 and the variance is 2.63. It is observed that both the inflation rate and the GDP Growth have a high variation for the period. The important thing to see is whether the fluctuations in the UK economy have an impact on financial and insurance services.

Financial and insurance services may be characterized by a high sensitivity to economic disruptions (Feyen et al., (2011); Beck and Webb (2003); Boyed and Champ (2003); Boyd et al., (2001)). It is therefore necessary to investigate the factors that determine the exports of financial and insurance services.

The purpose of this study is to clarify the determinants of the financial and insurance services exports of United Kingdom. The remainder of this paper is structured as follows: in the second part, the review of the literature is cited. In the third part of this paper the methodology is cited. In the fourth part the results of the regression are cited. The last part concludes. This research was based on the Linear Regression Analysis - Ordinary Least Squares (OLS). The next section presents a brief reference to the literature.

2. Review of the Literature

Financial services are a key element of the modern economy. A brief review of the literature is interesting. Zahler et al., (2014) mention that financial and insurance services are the most innovative sector. Moreover, Love and Mansury (2009) say that financial and insurance services engage in exporting. Briggs (2017) refer the importance of innovation in the financial and insurance services. King and Levine (1993a, 1993b); Rousseau and Wachtel (1998); Levine and Zervos (1998) and, Fink et al., (2003) mention the link between finance and growth. Catalan et al, (2000); Ward and Zurbruegg, (2000); Beenstock et al, (1988); Browne and Kim, (1993); Browne et al., (2000); Das et al., (2003); Holsboer, (1999) investigate the link between insurance and growth. Researchers such as Deaton (1992); Muradoglu and Taskin, (1996); Jabbar et al., (2002); Pal (2002); Barslund and Tarp (2008) and, Bendig et al., (2009) mention the financial and insurance services in developing countries. Researches such as Merton, (1992); McKinnon, (1973); Shaw, (1973); Jensen and Murphy, (1990); King and Levine, (1993); Obstfeld, (1994); Bencivenga et al., (1996); (Hicks, (1969); North, (1981); Greenwood and Jovanovic, (1990) mention the importance and role of the financial sector in the economy. Researches such as Grossman and Hart, (1980); DeAngelo and Rice, (1983); Stiglitz, (1985); Bhide, (1993); Jensen, (1993); Allen and Gale, (1997), (2000); Chakraborty and Ray, (2004); Levine, (2005) investigate the relationship of the financial sector with the banking industry. Researches such as Spiro, (1990); Mok, (1993); Shiller, (1988); Asprem, (1989); Barsky, (1989) mention the role of interest rates. Still, studies such as Ross, (1976); Adler and Dumas, (1983); Jorion, (1991); Dornbusch and Fisher (1980) investigate the effect of the exchange rate. Researches such as Hausmann and Fernández-Arias, (2000a), (2000b); Claessens et al., (2001) mention the role of foreign direct investment. Researches such as Calderon et al., (2002); Frankel and Rose (1998); Otto et al., (2001); Bordo and Helbling (2003); Kose et al., (2003); Imbs (2004); Eichengreen et al., (1996); Glick and Rose (1999); and Chinn and Forbes (2004) mention the role of trade. Surveys such as Amtiran, et al., (2017); Bulmash & Trivoli (1991); Maysami & Koh (2000); Simpson & Evans (2003); Brahmasrene & Jiranyakul (2007); Liu & Shrestha (2008); Ali (2011); Kuwornu & Victor (2011); Murcia (2014); Kotha & Sahu (2016) and Asekome & Agbonkhese (2015) have investigated the role of macroeconomic variables. The next section shows the methodology and the data.

3. Methodology and Data

This study attempts to investigate the factors that determine the financial and insurance services exports of United Kingdom. This research uses the percentage of exports of Financial and Insurance Services Exports. The period under review is 1993-2019. The trading partners selected are Germany, France, Ireland, Netherlands and United States (WITS, 2021). The countries have been selected because for most of the period under review they are among the top five export destinations for the period under review.

The database for this study is OECD and World Bank. The time period and the examining country has chosen firstly and mostly due to the availability of data. Moreover, the time period has chosen due to the fact that covers a sufficient time frame.

This study uses multiple-regression model as an estimator of annual time series data. The dependent variable is exports of Financial and Insurance Services. The study model expresses the exports of financial and insurance services as a function of: firstly, the Inflation of United Kingdom, the Exchange Rate of United Kingdom, the Multifactor Productivity of United Kingdom, the Industrial Production of Germany, France, Ireland, Netherlands and United States and the Investment (GFCF) of Germany, France, Ireland, Netherlands and United States. The above are the independent variables.

The study uses the traditional Multiple Regression technique, especially the traditional Ordinary Least Squared (OLS) technique (Hutcheson, 2011). Table 1. shows the dependent variable and the explanatory variables of the model.

Table 1: The dependent variable and the explanatory variables of the model.

Year	Financial and Insurance Exports (% of BoP) United Kingdom*	Inflation, GDP deflator (annual %) United Kingdom*	Exchange rates Total, National currency units/US dollar - United Kingdom**	Multifactor Productivity (annual %) United Kingdom**	Industrial Production Total, France (Index 2015=100)**	Industrial Production Total, Germany (Index 2015=100)**	Industrial Production Total, Ireland (Index 2015=100)**	Industrial Production Netherlands Total, (Index 2015=100)**	Industrial Production United States Total, (Index 2015=100)**	Investment (GFCF) Total, Annual growth rate (%) France**	Investment (GFCF) Total, Annual growth rate (%) Germany**	Investment (GFCF) Total, Annual growth rate (%) Netherlands**	Investment (GFCF) Total, Annual growth rate (%) Ireland**	Investment (GFCF) Total, Annual growth rate (%) United States**
1993	16.12	2.73	0.667	2,00	86.8	67.1	16.1	78.9	65,00	-5.4	-4.5	-1.6	-5.1	5.1
1994	16.79	1.39	0.653	1.4	90.0	69.2	18	82.7	68.4	1.6	3.6	2	11.8	6.1
1995	17.03	11.27	0.634	0.1	92.7	69.8	21.5	85.1	71.6	1.3	-0.2	5.9	15.8	5.2
1996	18.76	4.12	0.641	0.7	93.5	69.4	23.2	87.2	74.8	0.8	-0.4	6.7	16.4	7.7
1997	21.73	-0.07	0.611	4.3	97.5	71.8	27.3	86.7	80.2	0.8	0.5	6.4	15.8	7.2
1998	19.72	1.03	0.604	1.8	101.6	75.0	32.7	88.4	84.9	6.4	4.0	6.8	13.4	9.3
1999	22.92	0.94	0.618	2.1	104.3	76.2	37.5	91	88.6	7.8	4.3	10	14.1	8.3
2000	23.43	1.83	0.661	2.4	108.6	80.4	42.9	95.9	92.1	6.6	2.1	2.3	5.1	6.4
2001	25.73	1.12	0.695	1.4	109.9	80.5	47.6	95.9	89.2	2.3	-2.6	1.3	5.8	-0.4
2002	25.43	2.11	0.667	1.7	108.6	79.5	51.5	97	89.4	-0.9	-6.1	-4.1	5.6	-1.7
2003	27.80	2.37	0.612	2.5	107.7	79.7	54.4	95.8	90.6	1.9	-1.6	-1.7	8	4.2
2004	27.23	2.53	0.546	1.6	110.1	83.1	55.1	99.9	93.0	3.5	-0.4	0.2	9.8	6.0
2005	30.65	2.70	0.55	0.6	110.0	85.9	57.2	100.2	96.1	2.9	0.9	3.3	16.8	6.1
2006	32.76	2.81	0.543	1.5	110.8	90.9	59	102.3	98.2	3.6	7.5	7	7.2	2.7
2007	35.25	2.70	0.5	1,00	112.0	96.9	62.1	106.5	100.8	5.5	3.6	14.8	0	-0.6
2008	34.29	3.08	0.544	-0.5	109.0	97.7	60.7	107.3	97.3	0.9	1.6	-3	-11.6	-4.2
2009	34.85	1.62	0.642	-3.2	95.4	80.8	58	99.4	86.1	-9.1	-9.5	-8.6	-16.9	-12.5
2010	32.83	1.62	0.647	1.8	99.9	90.4	63	106.9	90.9	2.1	5.3	-6.8	-15	2.2
2011	34.25	2.07	0.624	-0.3	102.4	98.1	62.7	106.4	93.7	2.1	7.4	4.9	-0.1	4.6
2012	32.38	1.66	0.633	-0.7	99.8	97.1	61.8	105.9	96.5	0.2	-0.2	-6.3	16.1	6.9
2013	32.33	1.78	0.64	0.3	99.5	97.0	60.4	106.5	98.5	-0.8	-1.3	-1.6	-4.1	3.6
2014	30.59	1.73	0.608	0.1	98.4	99.0	73	103.6	101.4	0.0	3.2	-2.4	18.5	5.1
2015	28.60	0.66	0.655	1.2	100.0	100.0	100	100	100.0	1.0	1.7	29	50.6	3.7
2016	28.34	2.15	0.741	-0.7	100.5	101.5	101.8	101.4	97.8	2.7	3.8	-7.3	50.2	2.1
2017	26.99	1.94	0.777	0.5	102.5	104.5	99.5	102.5	99.1	4.7	2.6	4.2	-0.6	3.8
2018	26.47	2.25	0.75	0,00	103.2	105.7	94.6	103.1	102.3	3.3	3.4	3.6	-8.9	4.4
2019	25.29	2.15	0.783	-0.3	103.6	101.2	97.3	102.4	101.4	4.0	1.8	6.2	99.5	3.1

Source: (World Bank, (2021)* OECD (2021)**).

The study sets up the estimated multiple-regression model to test the above -mentioned hypotheses as follows:

$$FISExpUK_{it} = \beta_o + \beta_1 InfUK_t + \beta_2 ExcRatUK_t + \beta_3 MulPrUK_t + \beta_4 IndProFr_t + \beta_5 IndProGer_t + \beta_6 IndProIr_t + \beta_7 IndProNeth_t + \beta_8 IndProUnSt_t + \beta_9 InvestFr_t + \beta_{10} InvestGer_t + \beta_{11} InvestNeth_t + \beta_{12} InvestIr_t + \beta_{13} InvestUnSt_t + e_t \quad (1)$$

Where:

$FISExpUK_t$: stands for Financial and Insurance Exports (% of BoP) - United Kingdom
β_0: stands for the constant amount or the intercept.
β_1-β_{13}: are coefficients of the explanatory variables.
$InfUK_t$: Inflation, GDP deflator (annual %) United Kingdom
$ExcRatUK_t$: Exchange rates Total, National currency units/US dollar - United Kingdom
$MulPrUK_t$: Multifactor Productivity (annual %) - United Kingdom
$IndProFr_t$: Industrial Production Total, France (Index 2015=100)
$IndProGer_t$: Industrial Production Total, Germany (Index 2015=100)
$IndProIr_t$: Industrial Production Total, Ireland (Index 2015=100)
$IndProNeth_t$: Industrial Production Total, Netherlands (Index 2015=100)
$IndProUnSt_t$: Industrial Production Total, United States (Index 2015=100)
$InvestFr_t$: Investment (GFCF) Total, Annual growth rate (%) France
$InvestGer_t$: Investment (GFCF) Total, Annual growth rate (%) Germany
$InvestNeth_t$: Investment (GFCF) Total, Annual growth rate (%) Netherlands
$InvestIr_t$: Investment (GFCF) Total, Annual growth rate (%) Ireland
$InvestUnSt_t$: Investment (GFCF) Total, Annual growth rate (%) United States
e: stands for the error term.
t: stands for the year from the period 1993-2019.
i: stands for the country.

The next section presents the results of linear regression.

4. Results

Table 2. shows the regression results.

Table 2: Regression results

	Dependent variable:
	$FISExpUK_t$
$InfUK_t$	-0.315* (-0.651, 0.021)
$ExcRatUK_t$	-18.724** (-34.252, -3.197)
$MulPrUK_t$	-0.371 (-1.063, 0.321)
$IndProFr_t$	0.062 (-0.183, 0.307)
$IndProGer_t$	-0.154 (-0.381, 0.074)
$IndProIr_t$	0.040 (-0.046, 0.126)
$IndProNeth_t$	0.646*** (0.383, 0.908)
$IndProUnSt_t$	0.004 (-0.285, 0.292)
$InvestFr_t$	-0.468* (-0.952, 0.016)
$InvestGer_t$	0.275 (-0.058, 0.607)
$InvestNeth_t$	0.045 (-0.055, 0.145)
$InvestIr_t$	-0.008 (-0.039, 0.024)
$InvestUnSt_t$	-0.149 (-0.394, 0.097)
e	0.424 (-0.166, 1.014)
Constant	-17.665 (-45.600, 10.269)
Observations	27
R^2	0.976
Adjusted R^2	0.948
Residual Std. Error	1.341 (df = 12)
F Statistic	34.839*** (df = 14; 12)
Note:	*p<0.1; **p<0.05; ***p<0.01

Source: (Author's calculation)

The results of linear regression prove the functionality of the above model. The conclusions of this study are presented in the next section.

5. Conclusion

The present study has examined the determinants of Financial and Insurance Services exports of United Kingdom. Adjusted R^2 is high, with value of *0.948*. This means that the model constructed in this study explains the relationship of independent variables to the dependent one. Basically, the bigger the Adjusted R^2 the better the model fits to the data. The variables $InfUK_t$, $ExcRatUK_t$, $MulPrUK_t$, $IndProGer_t$, $InvestFr_t$, $InvestIr_t$, $InvestUnSt_t$ have a negative effect on the Financial and Insurance Services exports whereas the others variables have a positive effect.

Financial and Insurance Services is a branch of services which, from the results of the model of the present study, appears to be heavily influenced by the currency of the country concerned and by the production and investment of the trading partners. As can be seen from the analysis of the present research effort, it can be said that financial and insurance services (in this case the UK) are vulnerable to both inflation and the exchange rate. It can also be said that both industrial production and the investment of trading partners are important for financial and insurance services. In conclusion, the exports of financial and insurance services depend on the macroeconomic conditions of the country and on the course of production and investment of the country's trading partners. Further research is needed to establish a satisfactory analytical framework for Financial and Insurance Services.

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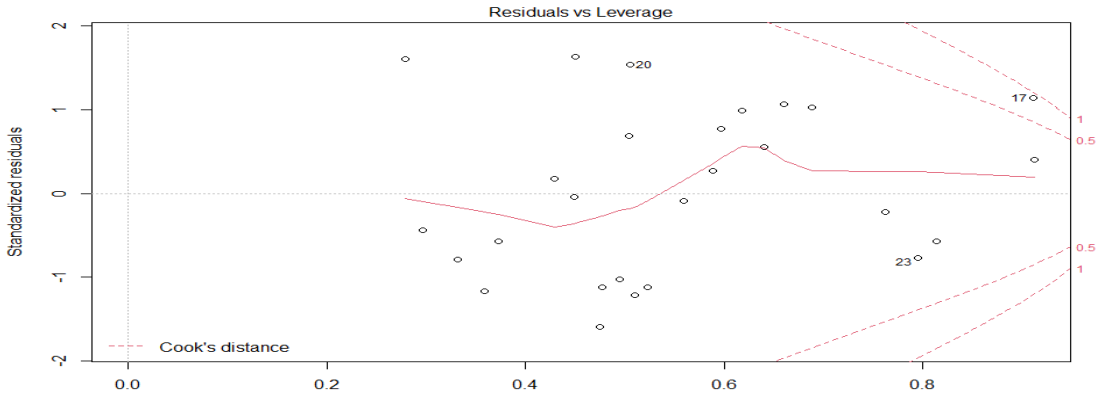
APPENDIX


Residuals vs Leverage
Standardized residuals
Cook's distance
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23
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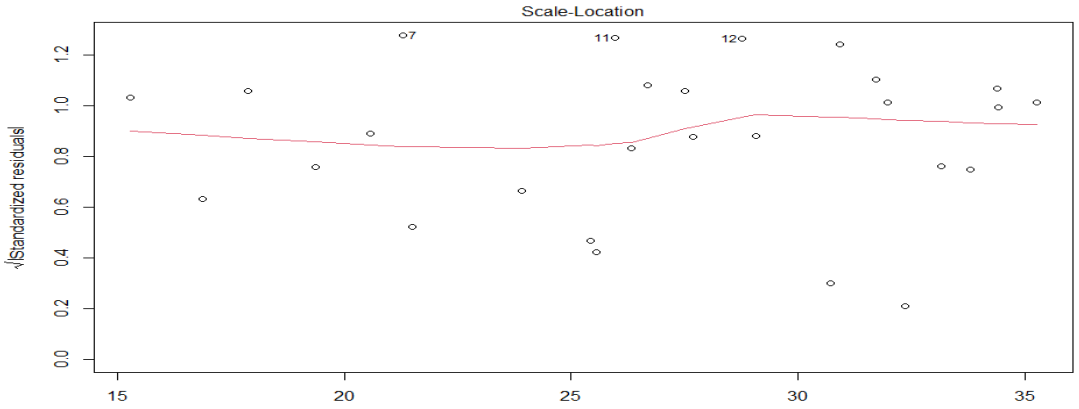
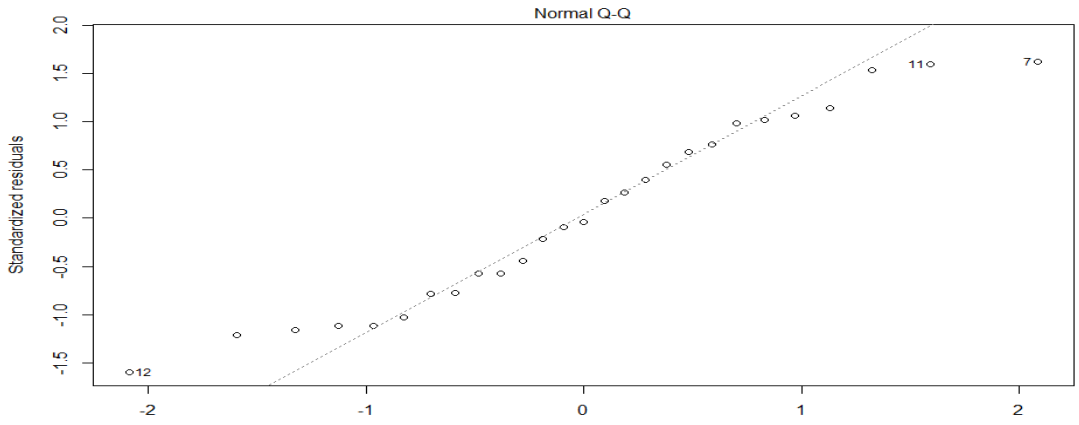
0.5
0.5
1
0.0
0.2
0.4
0.6
0.8


Scale-Location
√|Standardized residuals|
7
11
12
15
20
25
30
35


Normal Q-Q
Standardized residuals
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7
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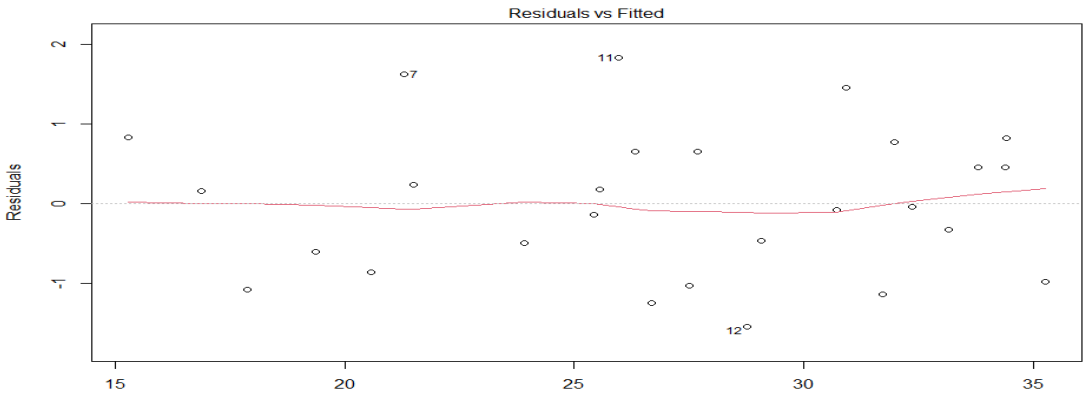
-1
0
1
2



Model Summary

R	0.988	RMSE	1.341
R-Squared	0.976	Coef. Var	4.969
Adj. R-Squared	0.948	MSE	1.798
Pred R-Squared	0.868	MAE	0.747

RMSE: Root Mean Square Error
MSE: Mean Square Error
MAE: Mean Absolute Error

ANOVA

	Sum of Squares	DF	Mean Square	F	Sig.
Regression	876.910	14	62.636	34.839	0.0000
Residual	21.575	12	1.798		
Total	898.485	26			

Parameter Estimates

model	Beta	Std. Error	Std. Beta	t	Sig	lower	upper
(Intercept)	-17.665	14.252		-1.239	0.239	-48.719	13.388
$InfUK_t$	-0.315	0.171	-0.106	-1.835	0.091	-0.688	0.059
$ExcRatUK_t$	-18.724	7.922	-0.222	-2.363	0.036	-35.986	-1.463
$MulPrUK_t$	-0.371	0.353	-0.089	-1.050	0.314	-1.140	0.398
$IndProFr_t$	0.062	0.125	0.071	0.495	0.629	-0.211	0.335
$IndProGer_t$	-0.154	0.116	-0.324	-1.325	0.210	-0.406	0.099
$IndProIr_t$	0.040	0.044	0.174	0.915	0.378	-0.055	0.136
$IndProNeth_t$	0.646	0.134	0.900	4.828	0.000	0.354	0.937
$IndProUnSt_t$	0.004	0.147	0.007	0.027	0.979	-0.317	0.325
$InvestFr_t$	-0.468	0.247	-0.276	-1.897	0.082	-1.006	0.070
$InvestGer_t$	0.275	0.170	0.179	1.620	0.131	-0.095	0.644
$InvestNeth_t$	0.045	0.051	0.059	0.877	0.398	-0.066	0.156
$InvestIr_t$	-0.008	0.016	-0.031	-0.484	0.637	-0.043	0.027
$InvestUnSt_t$	-0.149	0.125	-0.113	-1.185	0.259	-0.422	0.125
e	0.424	0.301	0.072	1.410	0.184	-0.231	1.079

Year	Real effective exchange rate index (2010 = 100)	Exports of goods and services (% of GDP)	GDP growth (annual %)	Inflation, consumer prices (annual %)
1990	119.57	23.07	0.73	8.06
1991	123.67	22.35	-1.10	7.46
1992	120.21	22.67	0.40	4.59
1993	108.61	24.56	2.49	2.56
1994	108.70	25.79	3.85	2.22
1995	104.07	25.55	2.53	2.70
1996	106.45	26.15	2.49	2.85
1997	123.32	25.56	4.98	2.20
1998	129.25	24.15	3.71	1.82
1999	129.11	23.94	3.30	1.75
2000	130.42	25.20	3.51	1.18
2001	127.26	25.19	2.73	1.53
2002	128.16	24.23	2.18	1.52
2003	122.93	23.93	3.32	1.38
2004	127.77	23.79	2.29	1.39
2005	125.43	25.06	2.96	2.09
2006	126.18	27.28	2.69	2.46
2007	128.27	25.36	2.36	2.39
2008	111.77	27.05	-0.27	3.52
2009	100.31	26.40	-4.11	1.96
2010	100.00	28.25	2.07	2.49
2011	99.83	30.71	1.28	3.86
2012	103.40	29.99	1.43	2.57
2013	102.05	29.87	2.19	2.29
2014	108.70	28.20	2.86	1.45
2015	113.76	27.26	2.36	0.37
2016	102.38	28.24	1.72	1.01
2017	97.08	30.11	1.74	2.56
2018	98.85	30.89	1.25	2.29
2019	98.42	31.08	1.37	1.74
2020	98.62	27.37	-9.79	0.99