



RESEARCH ARTICLE

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QUANTATIVE ANALYSIS AMONG FDI, GDP AND FOREIGN EXCHANGE RATE FROM 1982 TO 2018 OF G20 COUNTRIES: AN APPLICATION OF PREDICTIVE ANALYTICS TECHNIQUES WITH SPECIAL REFERENCE TO WORLD BANK DATA BASE

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ABSTRACT

G20 Countries are identified as one of the most attractive long-term investment destinations. The presence of large domestic market, fairly well developed financial architecture and skilled human resources, it can attract much larger foreign investments than it has done in the past. Its present international investment regime facilitates easy entry of foreign capital in almost all areas subject to specific limits on foreign ownership. Entry options have not only become procedurally simpler, but prospects for higher yields from investment have also become brighter. But further boost to Foreign Direct Investment (FDI) will depend significantly on further liberalization of its foreign investment regime. This study attempts to focus on an insight into G20 countries: Study of interrelationship among FDI, GDP and Foreign Exchange Rate from 1982 to 2018 and forecast of GDP and Foreign Exchange Rate from 2019 to 2022.

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INTRODUCTION

Since the unfolding of the 2008 global financial crisis, the G20 has played a major role in coordinating macroeconomic policies of major economies and reviving the world economy. As the world's primary forum for international economic cooperation, its objectives have been to ensure more sustainable and balanced growth, achieve economic and financial stability and reform the prevailing international financial architecture. In the wake of the crisis, there was a sense of urgency and strong agreement to enact extraordinary policy measures to fend off the collapse of the real sector because of the collapse of confidence in the financial sector. The G20 performed spectacularly in this regard: global gross domestic product(GDP) contracted less than expected in 2009 and rebounded faster than expected in 2010(Ahluwalia 2011). These coordinated actions were widely credited for forestalling a second Great Depression, with the G20 declaring victory at their third summit at Pittsburgh in September 2009(It worked). Since 2009, Indian Council for Research on International Economic Relations (ICRIER), along with its partners, has been organizing a high level annual conference that brings

together academics and key policymakers from G20 member countries and International Financial Institutions (IFIs) to deliberate on a range of issues related to the G20. G-20 Countries are:- As of 2014, Argentina, Australia, Brazil, Canada, China, France, Germany,India, Indonesia, Italy, Japan,Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, the United States and the European Union make up the G20. G20 countries are the largest economy in terms GDP in the world. With its consistent growth performance and high-skilled manpower, provides enormous opportunities for foreign investment. Since the beginning of economic reforms in 1991, major reform initiatives have been taken up in the field of investment, trade and financial sector. Enactment of Competition Act, liberalization of Foreign Exchange Management Act (FEMA), and amendments in Intellectual Property Right laws and many other initiatives make G20 attractive for business. G20 countries are the most attractive foreign Direct Investment destination (A.T. Kearney 2007). Also it is the most attractive destination among transnational Corporations for FDI 2007-09 (UNCTAD's World Investment Report, 2007). Though FDI inflows have responded positively to policy changes, there might have been much more had foreign investment not been

regulated in some key areas. Till the 1990s, the policy was heavily restrictive with majority foreign equity permitted only in a handful export oriented, high technology industries. Initiated reforms changed the perceptions of foreign investors with foreign investment policy becoming progressively liberal following steady withdrawal of external capital controls and simplification of procedures. While India has an overall market-friendly and liberal policy towards foreign investment, foreign capital still does not enjoy equally easy access in all parts of the economy. The manufacturing sector is still untapped accompanied by lack of access in certain services and agriculture. India's future foreign investment policy faces the critical challenge of increasing access of foreign capital to these segments. Keeping in mind the issues relating to foreign investment, the study aims to achieve the Following objectives:

This study attempts to focus on an insight into G20 countries: Study of interrelationship among FDI, GDP and Foreign Exchange Rate from 1982 to 2018 and forecast of GDP and Foreign Exchange Rate from 2019 to 2022.

The rest of the paper is divided into four sections. Section II presents the literature review on policy regime as a determinant of FDI Section III represents the brief outline of the International Investment Regime i.e. FDI policy. Section IV represents the relationship between FDI and economic policy variables taking following factors into consideration namely, market size, openness (exports and imports), lending rates, debt service ability, strength of legal rights and tax structure followed by the concluding remarks. Section V represents the data and methodology and section VI represents the concluding remarks.

foreign investor establishes a new venture in the host country. It is merger & acquisition if the foreign investor makes an acquisition of the whole or part of an existing firm or project in the host country is purchased. International Monetary Fund (1996) maintains that foreign direct investment (FDI) is a category of international investment in which a resident entity in one economy (the direct or foreign investor) acquires a lasting interest in an enterprise resident in another economy (the direct investment enterprise). Whether the lasting interest is related to a controlling interest or to potential control is immaterial. It is constituted that the foreign investor should own at least 10% of on overseas direct investment enterprise to control and influence the management of the investment (IMF 1996). FDI in India means investment by non-resident entity/person resident outside India in the capital of the Indian company under Schedule 1 of FEM (Transfer or Issue of Security by a Person Resident outside India) Regulations 2000 (Consolidated FDI Policy Circular, DIPP, 2010).

Foreign portfolio investment (FPI) on the other hand, is a financial investment made by an investor from one country in the securities markets of another country, seeking purely financial gains in the form of income or capital. Generally, this is a short – term investment in shares, bonds, notes, money market instruments and financial derivatives, and does not imply significant control over or a lasting interest in the enterprises concerned.

FDI determinants: According to the OLI paradigm of Dunning , the presence of ownership-specific competitive (O) advantages in a transnational corporation, the presence of locational advantages (L) in a host country, and the presence of superior commercial benefits internally in a firm (I) are

Table 1. Select Studies on the Determinants of FDI

Author(Year)	Country/Sector	Key Findings
Moosa,Imad A, Cardak,Buly A(2006)	138 countries	Countries with high degree of openness and low country risk attract more FDI
Kok,Reap,ErsoyBernur A(2009)	Developing countries	Countries should develop policies particular to their own economic structure depending on the FDI determinant.
Neumayer, Eric, Spess, Laura(2005)	Developing countries	Higher number of Bilateral Investment Treaties (BITs) results in more inflows of FDI.
Zheng, Ping(2009)	India and China	Inward FDI is influenced by economic growth, exports, country and political risks/policy liberalization.
Sahoo,Pravakar(2006)	South Asia	Major Determinants of FDI in South Asia are market size, labor force growth, infrastructure index and trade openness.
Peter Montiel, Carmen M.Reinhart(1999)	Emerging Economies	Sterilized intervention in policies increases the capital flows in the form of portfolio investment than FDI. Reduced capital controls increases FDI.
Sung-Hoon Lim(2008)	China	Investment promotion positively affects the attraction of FDI.
Qian Sun, Wilson Tong,Qiao Yu (2002)	China	FDI determinants move through time.Labor quality and infrastructure are important determinants of the distribution of FDI. High labor quality and good infrastructure attract foreign investors. For the country as a whole, political stability and its openness to the foreign world add another important dimension to drawing in foreign capital.
Douglas E.Thomas,Robert Grosse(2001)	Mexico	Economic, socio-political, and geographic factors are hypothesized to be important country-of-origin determinants of FDI into Mexico.
Singh Harinder, Jun,Kwang W(1995)	Developing countries	Political risk, business conditions and macroeconomic policies matter for FDI.

LITERATURE REVIEW

FDI Defined: In the present era of liberalization, role played by growth of international trade have increasingly influenced FDI and FPI into developing countries. FDI is the largest component of long-term capital flows to developing countries and is expected to remain their dominant source of external finance. Danziger (1997) defines FDI broadly as an investment made by a foreign investor in order to acquire an ongoing interest in an enterprise operating in a country other than the investor's home country. The foreign investor intends to exercise some control over the management of the direct investment enterprise. It is a Greenfield investment if the

three important set of determinants which influence the FDI inflows. World Association of Investment Promotion Agencies (WAIPS), Newsletter (September-2005) emphasized on Transparency in investment rules and procedures through e-regulations system containing detailed, step-by-step, data on national legislation and procedures applicable to the foreign investment operation. It offers online access to forms and is connected to public offices; it also indicates where and how the investor can complain in case of disagreement. As per UNCTAD secretariat report on Investment Policy Developments in G20 countries (2009),167 policy measures have been undertaken, contained in laws and legislation adopted between 1 October 2008 and 15 June 2009 by the 42

countries surveyed. The various measures taken by most of the G20 countries includes:-

- (a) Easy entry of foreign investors: by opening up of previously closed sectors of the economy to foreign investment and removing/relaxing sectoral caps for foreign investment. For example 100 % foreign ownership under automatic route was allowed in electricity generation, transmission and distribution in June 1998.
- (b) Streamlining approval procedures: For example by lowering the threshold for review of investment and acquisition projects, clarifying decentralized responsibilities for approval of foreign investment projects, or relaxing the review procedures for foreign investment in real estate.
- (c) Facilitation of foreign investment projects: For example, in the form of granting specific incentives to investments in certain areas of a country, or facilitating the operation of companies in Special Economic Zones. Other measures aim at facilitating the operation of foreign investors.
- (d) China and India ---two emerging economy members of the G20 --- signed BITs, a development reflecting their growing role as capital exporting countries.

Moreover, three of these countries' International Investment Agreements (IIAs) are South-South agreements, demonstrating the increasing importance of South-South economic cooperation in the field of FDI. Undoubtedly, most of the G20 countries are identified as the fastest growing economy (For example India as well as China) today and has been able to attract substantial foreign investment. However greater investments can flow in with right kind of policy framework.

Brief outline of the regime: Among the most favoured destination of FDI of the G20 countries, India's present policy framework for inward FDI was introduced by the Industrial Policy Statement of July 24, 1991. The foreign investment regime in India has been gradually liberalized by successive governments since the liberalization process commenced in 1991. Attempts have been made to simplify the regime to encourage FDI and to foster competition in the Indian market. Foreign investment, while still controlled, is actively encouraged by the Indian government and amounted to USD 35.1 billion in fiscal year 2009. The policy is reviewed on continued basis and amendments are notified through Press Notes by SIA, DIPP.

The present policy allows foreign investors to invest in resident entities through either the automatic route or the government-administered route. Most sectors and activities qualify for the automatic route. This route allows investors to bring in funds without obtaining prior permission from the Government, RBI, or any other regulatory agency. However, invested enterprises are required to inform RBI within 30 days of receipt of funds and also comply with documentation requirements within 30 days of issue of shares to foreign investors.

Economic and policy variables as determinants of fdi of the g20 countries: The direction and magnitude of capital flows between emerging and developed-country markets depend on the relative attractiveness of placing funds in emerging markets vis-a-vis developed-country markets, as well as the ease with which such transactions can be carried out which in turn depends on the liberalization of policy regime. The FDI environment in India has undergone a sea change since the inception of economic reforms in 1991. Like other members of the G20 countries India's strengths as an investment destination rest on strong fundamentals, including a large and growing market; world-class scientific, technical and managerial manpower, cost-effective and highly skilled labor, an abundance of natural resources, liberal and investor friendly international regime and an independent judiciary. Out of the determinants widely used by researchers, this study examines the economic and policy variables as a determinant of FDI.

DATA AND METHODOLOGY

In order to show the interrelationship between FDI, GDP and FOREIGN EXCHANGE RATE, all data are collected from the World Bank and the period of study is 1982 to 2015. To materialize this interrelationship, we set out two linear regression equation: -

- 1) Linear regression equation when GDP depends on FDI
- 2) Linear regression equation when Foreign Exchange Rate depends on FDI.

Added to the above equation FDI has been forecasted from 2019 to 2022 using ARIMA modelling techniques. The coefficients obtained from these two equations have been applied accordingly on the forecasted FDI data to forecast GDP and Foreign Exchange rate for the time period from 2019 to 2022.,-this is shown in the following Table: 2(iso2c is the Country Code of World Bank which denotes the specific

iso2c	country	year	FDI	GDP	ER
AR	Argentina	1982	-2.57E+08	8.43E+10	2.59E-07
AR	Argentina	1983	-1.83E+08	1.04E+11	1.05E-06
AR	Argentina	1984	-2.68E+08	7.91E+10	6.76E-06
AR	Argentina	1985	-9.19E+08	8.84E+10	6.02E-05
AR	Argentina	1986	-5.74E+08	1.11E+11	9.43E-05
AR	Argentina	1987	1.90E+07	1.11E+11	0.00021443
AR	Argentina	1988	-1.15E+09	1.26E+11	0.00087526
AR	Argentina	1989	-1.03E+09	7.66E+10	0.042333961
AR	Argentina	1990	-1.84E+09	1.41E+11	0.487589083
AR	Argentina	1991	-2.44E+09	1.9E+11	0.953554417
AR	Argentina	1992	-3265063223	2.29E+11	0.990641667
AR	Argentina	1993	-2088015410	2.37E+11	0.998945833
AR	Argentina	1994	-2622087878	2.57E+11	0.999008333
AR	Argentina	1995	-4112274404	2.58E+11	0.99975
AR	Argentina	1996	-5347787687	2.72E+11	0.9996625
AR	Argentina	1997	-5507454052	2.93E+11	0.9995
AR	Argentina	1998	-4965180132	2.99E+11	0.9995
AR	Argentina	1999	-22257413390	2.84E+11	0.9995

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AR	Argentina	2000	-9517286140	2.84E+11	0.9995
AR	Argentina	2001	-2005260142	2.69E+11	0.9995
AR	Argentina	2002	-2776050000	9.77E+10	3.063256667
AR	Argentina	2003	-878230000	1.28E+11	2.900629167
AR	Argentina	2004	-3448720000	1.65E+11	2.923300819
AR	Argentina	2005	-3954190000	1.99E+11	2.9036575
AR	Argentina	2006	-3098627066	2.33E+11	3.054313333
AR	Argentina	2007	-4968924801	2.88E+11	3.095648849
AR	Argentina	2008	-8334618541	3.62E+11	3.14416456
AR	Argentina	2009	-3305612521	3.33E+11	3.710106831
AR	Argentina	2010	-10367957946	4.24E+11	3.896295154
AR	Argentina	2011	-9351930945	5.3E+11	4.110139576
AR	Argentina	2012	-14269084339	5.46E+11	4.53693436
AR	Argentina	2013	-8931688999	5.52E+11	5.459352665
AR	Argentina	2014	-3144794109	5.26E+11	8.075275993
AR	Argentina	2015	-10883760784	5.95E+11	9.233185525
AR	Argentina	2016	-1473633407	5.58E+11	14.75817509
AR	Argentina	2017	-10361231244	6.43E+11	16.56270693
AR	Argentina	2018	-10070635996	5.2E+11	28.09499167
AR	Argentina	2019	NA	NA	NA
AU	Australia	1982	NA	1.94E+11	0.985862832
AU	Australia	1983	NA	1.77E+11	1.110014999
AU	Australia	1984	NA	1.93E+11	1.139519166
AU	Australia	1985	NA	1.8E+11	1.431895
AU	Australia	1986	NA	1.82E+11	1.495974166
AU	Australia	1987	NA	1.89E+11	1.42818
AU	Australia	1988	NA	2.36E+11	1.279908333
AU	Australia	1989	-5000323944	2.99E+11	1.264596667
AU	Australia	1990	-7824698719	3.11E+11	1.281056667
AU	Australia	1991	-3782555746	3.25E+11	1.283755833
AU	Australia	1992	-1106562011	3.25E+11	1.361648333
AU	Australia	1993	-2767984260	3.12E+11	1.47056
AU	Australia	1994	-2630684042	3.22E+11	1.367750833
AU	Australia	1995	-9222498129	3.67E+11	1.3490325
AU	Australia	1996	441654791.4	4E+11	1.277863333
AU	Australia	1997	-2007441432	4.35E+11	1.34738
AU	Australia	1998	-2932190621	3.99E+11	1.591828333
AU	Australia	1999	-1898249310	3.89E+11	1.54995
AU	Australia	2000	-10797958705	4.15E+11	1.724826667
AU	Australia	2001	2663165109	3.78E+11	1.9334425
AU	Australia	2002	-7681971735	3.95E+11	1.8405625
AU	Australia	2003	9612586773	4.66E+11	1.541914167
AU	Australia	2004	-33123390587	6.12E+11	1.3597525
AU	Australia	2005	-7620252751	6.93E+11	1.309473333
AU	Australia	2006	-6470053661	7.46E+11	1.327973441
AU	Australia	2007	-30020094089	8.53E+11	1.1950725
AU	Australia	2008	-13272117217	1.05E+12	1.192178333
AU	Australia	2009	-17218512630	9.28E+11	1.28218881
AU	Australia	2010	-17142068311	1.15E+12	1.090159486
AU	Australia	2011	-57304251200	1.4E+12	0.969463201
AU	Australia	2012	-51785739222	1.55E+12	0.965801031
AU	Australia	2013	-54767994546	1.58E+12	1.035843097
AU	Australia	2014	-40630459096	1.47E+12	1.109363293
AU	Australia	2015	-38633221206	1.35E+12	1.331090262
AU	Australia	2016	-46007279369	1.21E+12	1.345213976
AU	Australia	2017	-39208833875	1.33E+12	1.304758077
AU	Australia	2018	-62366591813	1.43E+12	1.338412146
AU	Australia	2019	NA	NA	NA
BR	Brazil	1982	-2.53E+09	2.82E+11	7.77E-11
BR	Brazil	1983	-1.42E+09	2.03E+11	2.50E-10
BR	Brazil	1984	-1.55E+09	2.09E+11	8.00E-10
BR	Brazil	1985	-1.36E+09	2.23E+11	2.68E-09
BR	Brazil	1986	-2.02E+08	2.68E+11	5.91E-09
BR	Brazil	1987	-1.03E+09	2.94E+11	1.70E-08
BR	Brazil	1988	-2.63E+09	3.3E+11	1.14E-07
BR	Brazil	1989	-6.08E+08	4.26E+11	1.23E-06
BR	Brazil	1990	-3.24E+08	4.62E+11	2.96E-05
BR	Brazil	1991	-8.90E+07	6.03E+11	0.000175961
BR	Brazil	1992	-1.92E+09	4.01E+11	0.001953024
BR	Brazil	1993	-8.01E+08	4.38E+11	0.038276611
BR	Brazil	1994	-2.04E+09	5.58E+11	0.664683514
BR	Brazil	1995	-3.48E+09	7.69E+11	0.917666667
BR	Brazil	1996	-1.17E+10	8.5E+11	1.0051
BR	Brazil	1997	-1.86E+10	8.83E+11	1.077991667
BR	Brazil	1998	-2.92E+10	8.64E+11	1.160516667
BR	Brazil	1999	-2.69E+10	5.99E+11	1.813932847

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BR	Brazil	2000	-30497652700	6.55E+11	1.829423122
BR	Brazil	2001	-24714939372	5.59E+11	2.349631709
BR	Brazil	2002	-14108096193	5.08E+11	2.920363018
BR	Brazil	2003	-9894224671	5.58E+11	3.077475118
BR	Brazil	2004	-8694901855	6.69E+11	2.92511945
BR	Brazil	2005	-12549590735	8.92E+11	2.434390036
BR	Brazil	2006	9420275577	1.11E+12	2.175326667
BR	Brazil	2007	-27518241273	1.4E+12	1.947058333
BR	Brazil	2008	-24601090274	1.7E+12	1.833766667
BR	Brazil	2009	-36032806300	1.67E+12	1.999428173
BR	Brazil	2010	-55626923029	2.21E+12	1.759226711
BR	Brazil	2011	-86360112758	2.62E+12	1.672828755
BR	Brazil	2012	-90485114844	2.47E+12	1.953068611
BR	Brazil	2013	-59567524383	2.47E+12	2.156089151
BR	Brazil	2014	-67107133932	2.46E+12	2.352951963
BR	Brazil	2015	-61604172557	1.8E+12	3.326904383
BR	Brazil	2016	-59601136008	1.8E+12	3.491313422
BR	Brazil	2017	-47544559630	2.05E+12	3.191389446
BR	Brazil	2018	-76138003139	1.87E+12	3.653825361
BR	Brazil	2019	NA	NA	NA
CA	Canada	1982	2281061698	3.14E+11	1.233734912
CA	Canada	1983	629011721.3	3.41E+11	1.232411827
CA	Canada	1984	-1090877860	3.55E+11	1.295065611
CA	Canada	1985	2507671553	3.65E+11	1.365507392
CA	Canada	1986	655376615.3	3.77E+11	1.389471059
CA	Canada	1987	-994078844.8	4.31E+11	1.325982582
CA	Canada	1988	149516835.8	5.07E+11	1.230700847
CA	Canada	1989	-756426909.1	5.65E+11	1.183972084
CA	Canada	1990	-2351322580	5.94E+11	1.166773627
CA	Canada	1991	2962324152	6.1E+11	1.145725844
CA	Canada	1992	-1229978110	5.92E+11	1.20872292
CA	Canada	1993	962554678.6	5.77E+11	1.290087882
CA	Canada	1994	1079642881	5.78E+11	1.365673448
CA	Canada	1995	2170895576	6.04E+11	1.372445418
CA	Canada	1996	3471751715	6.29E+11	1.363521636
CA	Canada	1997	11546289245	6.53E+11	1.384598028
CA	Canada	1998	11369485482	6.32E+11	1.483505302
CA	Canada	1999	-7526468527	6.76E+11	1.485704819
CA	Canada	2000	-21653038994	7.42E+11	1.485394095
CA	Canada	2001	8440763883	7.36E+11	1.548839955
CA	Canada	2002	4749229278	7.58E+11	1.570342834
CA	Canada	2003	16417567996	8.92E+11	1.401014548
CA	Canada	2004	43370579703	1.02E+12	1.301281595
CA	Canada	2005	1727389339	1.17E+12	1.211405134
CA	Canada	2006	-13950022417	1.32E+12	1.134344726
CA	Canada	2007	-55310207534	1.46E+12	1.074045622
CA	Canada	2008	18568974469	1.55E+12	1.067086918
CA	Canada	2009	16787996096	1.37E+12	1.141535406
CA	Canada	2010	6626667134	1.61E+12	1.030112735
CA	Canada	2011	11756393310	1.79E+12	0.989258159
CA	Canada	2012	12879466786	1.82E+12	0.999364744
CA	Canada	2013	-12563236013	1.84E+12	1.030137364
CA	Canada	2014	805191688.4	1.8E+12	1.104747132
CA	Canada	2015	23927632715	1.55E+12	1.278786204
CA	Canada	2016	33906058035	1.53E+12	1.325615164
CA	Canada	2017	54372238483	1.65E+12	1.297935846
CA	Canada	2018	7175351975	1.71E+12	1.295817928
CA	Canada	2019	NA	NA	NA
CN	China	1982	-3.86E+08	2.05E+11	1.892541666
CN	China	1983	-5.43E+08	2.31E+11	1.975674999
CN	China	1984	-1.12E+09	2.6E+11	2.320041666
CN	China	1985	-1.03E+09	3.09E+11	2.936658333
CN	China	1986	-1.43E+09	3.01E+11	3.452791667
CN	China	1987	-1.67E+09	2.73E+11	3.7221
CN	China	1988	-2.34E+09	3.12E+11	3.7221
CN	China	1989	-2.61E+09	3.48E+11	3.765108333
CN	China	1990	-2.66E+09	3.61E+11	4.783208333
CN	China	1991	-3.45E+09	3.83E+11	5.323391667
CN	China	1992	-7.16E+09	4.27E+11	5.514591667
CN	China	1993	-2.31E+10	4.45E+11	5.761958333
CN	China	1994	-3.18E+10	5.64E+11	8.618742667
CN	China	1995	-33849200000	7.35E+11	8.351416667
CN	China	1996	-3.81E+10	8.64E+11	8.314175
CN	China	1997	-4.17E+10	9.62E+11	8.289816667
CN	China	1998	-4.11E+10	1.03E+12	8.278958333

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CN	China	1999	-3.70E+10	1.09E+12	8.27825
CN	China	2000	-37483300000	1.21E+12	8.278504167
CN	China	2001	-3.74E+10	1.34E+12	8.277068333
CN	China	2002	-46789569179	1.47E+12	8.2769575
CN	China	2003	-49444853744	1.66E+12	8.277036667
CN	China	2004	-60144670468	1.96E+12	8.276800833
CN	China	2005	-90379127564	2.29E+12	8.194316667
CN	China	2006	-1.0015E+11	2.75E+12	7.973438333
CN	China	2007	-1.39095E+11	3.55E+12	7.6075325
CN	China	2008	-1.14792E+11	4.59E+12	6.948655
CN	China	2009	-87167067370	5.1E+12	6.831416052
CN	China	2010	-1.8575E+11	6.09E+12	6.770269029
CN	China	2011	-2.31652E+11	7.55E+12	6.461461327
CN	China	2012	-1.7625E+11	8.53E+12	6.312332827
CN	China	2013	-2.17958E+11	9.57E+12	6.195758346
CN	China	2014	-1.44968E+11	1.04E+13	6.143434094
CN	China	2015	-68098649765	1.1E+13	6.227488673
CN	China	2016	41674876170	1.11E+13	6.644477829
CN	China	2017	-27790987920	1.21E+13	6.758755086
CN	China	2018	-1.0702E+11	1.36E+13	6.615957177
CN	China	2019	NA	NA	NA
DE	Germany	1982	2259195166	7.77E+11	2.426591666
DE	Germany	1983	1945566942	7.71E+11	2.553258332
DE	Germany	1984	4135994597	7.25E+11	2.845941666
DE	Germany	1985	4964708241	7.33E+11	2.943966667
DE	Germany	1986	8205604897	1.05E+12	2.171483333
DE	Germany	1987	6640908620	1.3E+12	1.797391667
DE	Germany	1988	13468590800	1.4E+12	1.756225
DE	Germany	1989	8162668023	1.4E+12	1.880041667
DE	Germany	1990	21480192635	1.77E+12	1.615733333
DE	Germany	1991	18555313747	1.87E+12	1.659541667
DE	Germany	1992	21230462203	2.13E+12	1.56165
DE	Germany	1993	17161584361	2.07E+12	1.653320833
DE	Germany	1994	12339100060	2.21E+12	1.622794167
DE	Germany	1995	27778316539	2.59E+12	1.4331325
DE	Germany	1996	44977189363	2.5E+12	1.504774167
DE	Germany	1997	30890591110	2.21E+12	1.734055833
DE	Germany	1998	67478470728	2.24E+12	1.7596676
DE	Germany	1999	53364279143	2.19E+12	NA
DE	Germany	2000	-1.49835E+11	1.94E+12	NA
DE	Germany	2001	13294434783	1.94E+12	NA
DE	Germany	2002	-34067396991	2.07E+12	NA
DE	Germany	2003	-26100676287	2.5E+12	NA
DE	Germany	2004	29478097771	2.81E+12	NA
DE	Germany	2005	29088956904	2.85E+12	NA
DE	Germany	2006	60529918995	2.99E+12	NA
DE	Germany	2007	89805058432	3.42E+12	NA
DE	Germany	2008	67071495031	3.73E+12	NA
DE	Germany	2009	43037329587	3.4E+12	NA
DE	Germany	2010	60605522285	3.4E+12	NA
DE	Germany	2011	10373148758	3.74E+12	NA
DE	Germany	2012	33639173474	3.53E+12	NA
DE	Germany	2013	26060211771	3.73E+12	NA
DE	Germany	2014	87826023921	3.88E+12	NA
DE	Germany	2015	68424263446	3.36E+12	NA
DE	Germany	2016	46563013259	3.47E+12	NA
DE	Germany	2017	54012800980	3.66E+12	NA
DE	Germany	2018	53784267924	3.95E+12	NA
DE	Germany	2019	NA	NA	NA
EU	European Union	1982	NA	3.31E+12	NA
EU	European Union	1983	NA	3.21E+12	NA
EU	European Union	1984	NA	3.08E+12	NA
EU	European Union	1985	NA	3.19E+12	NA
EU	European Union	1986	NA	4.37E+12	NA
EU	European Union	1987	NA	5.41E+12	NA
EU	European Union	1988	NA	6.03E+12	NA
EU	European Union	1989	NA	6.16E+12	NA
EU	European Union	1990	NA	7.64E+12	NA
EU	European Union	1991	NA	7.9E+12	NA
EU	European Union	1992	NA	8.61E+12	NA
EU	European Union	1993	NA	7.84E+12	NA
EU	European Union	1994	NA	8.31E+12	NA

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EU	European Union	1995	NA		9.64E+12	NA
EU	European Union	1996	NA		9.84E+12	NA
EU	European Union	1997	NA		9.29E+12	NA
EU	European Union	1998	NA		9.62E+12	NA
EU	European Union	1999	NA		9.6E+12	NA
EU	European Union	2000	NA		8.92E+12	NA
EU	European Union	2001	NA		9.03E+12	NA
EU	European Union	2002	NA		9.83E+12	NA
EU	European Union	2003	NA		1.2E+13	NA
EU	European Union	2004	NA		1.38E+13	NA
EU	European Union	2005	NA		1.44E+13	NA
EU	European Union	2006	NA		1.54E+13	NA
EU	European Union	2007	NA		1.78E+13	NA
EU	European Union	2008	NA		1.92E+13	NA
EU	European Union	2009	NA		1.71E+13	NA
EU	European Union	2010	NA		1.7E+13	NA
EU	European Union	2011	NA		1.84E+13	NA
EU	European Union	2012	NA		1.73E+13	NA
EU	European Union	2013	NA		1.81E+13	NA
EU	European Union	2014	NA		1.87E+13	NA
EU	European Union	2015	NA		1.65E+13	NA
EU	European Union	2016	NA		1.66E+13	NA
EU	European Union	2017	NA		1.74E+13	NA
EU	European Union	2018	NA		1.88E+13	NA
EU	European Union	2019	NA	NA		NA
FR	France	1982	1263379265		5.85E+11	6.572099999
FR	France	1983	-12428342.43		5.6E+11	7.621291666
FR	France	1984	-278840848.3		5.31E+11	8.7391
FR	France	1985	-352722357.3		5.53E+11	8.985225
FR	France	1986	2147334762		7.71E+11	6.926091667
FR	France	1987	4070655496		9.34E+11	6.010708333
FR	France	1988	6006210178		1.02E+12	5.956941667
FR	France	1989	9193689820		1.03E+12	6.380141667
FR	France	1990	21640172227		1.27E+12	5.445275
FR	France	1991	8778998289		1.27E+12	5.642116667
FR	France	1992	9429508956		1.4E+12	5.293815833
FR	France	1993	-149530697.1		1.32E+12	5.66323
FR	France	1994	8641023245		1.39E+12	5.552045
FR	France	1995	-7915340633		1.6E+12	4.9914825
FR	France	1996	8389214530		1.61E+12	5.1155225
FR	France	1997	12439587260		1.45E+12	5.836691667
FR	France	1998	16182755399		1.5E+12	5.899515667
FR	France	1999	79455181690		1.49E+12	NA
FR	France	2000	1.32207E+11		1.36E+12	NA
FR	France	2001	37230890649		1.38E+12	NA
FR	France	2002	1451944338		1.49E+12	NA
FR	France	2003	10242909368		1.84E+12	NA
FR	France	2004	25513610483		2.12E+12	NA
FR	France	2005	33660365153		2.2E+12	NA
FR	France	2006	51482577203		2.32E+12	NA
FR	France	2007	48449400449		2.66E+12	NA
FR	France	2008	68001785591		2.92E+12	NA
FR	France	2009	70295520050		2.69E+12	NA
FR	France	2010	33671093774		2.64E+12	NA
FR	France	2011	20277561651		2.86E+12	NA
FR	France	2012	19070158223		2.68E+12	NA
FR	France	2013	-13973846914		2.81E+12	NA
FR	France	2014	47288734074		2.85E+12	NA
FR	France	2015	8404253504		2.44E+12	NA
FR	France	2016	41841316017		2.47E+12	NA
FR	France	2017	13926683233		2.59E+12	NA
FR	France	2018	66364673387		2.78E+12	NA
FR	France	2019	NA	NA		NA
GB	United Kingdom	1982	1749688494		5.15E+11	0.572446832
GB	United Kingdom	1983	3005286142		4.9E+11	0.659724582
GB	United Kingdom	1984	8324649803		4.61E+11	0.751806666
GB	United Kingdom	1985	5130017497		4.89E+11	0.779246
GB	United Kingdom	1986	8448719924		6.01E+11	0.682197333
GB	United Kingdom	1987	15850160396		7.45E+11	0.6119265
GB	United Kingdom	1988	15205149253		9.1E+11	0.562170167
GB	United Kingdom	1989	4270004426		9.27E+11	0.61117275

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GB	United Kingdom	1990	-13379913178	1.09E+12	0.563177167
GB	United Kingdom	1991	302418661.4	1.14E+12	0.567015333
GB	United Kingdom	1992	3139617820	1.18E+12	0.569774167
GB	United Kingdom	1993	10735545430	1.06E+12	0.666756553
GB	United Kingdom	1994	24171411205	1.14E+12	0.653426604
GB	United Kingdom	1995	27379619676	1.34E+12	0.63366812
GB	United Kingdom	1996	9301532237	1.42E+12	0.640958255
GB	United Kingdom	1997	23386816482	1.56E+12	0.610836114
GB	United Kingdom	1998	48157120558	1.65E+12	0.603823594
GB	United Kingdom	1999	1.12454E+11	1.68E+12	0.618056845
GB	United Kingdom	2000	1.27916E+11	1.66E+12	0.660930833
GB	United Kingdom	2001	21321018558	1.64E+12	0.694655
GB	United Kingdom	2002	31141421728	1.78E+12	0.667223333
GB	United Kingdom	2003	46069635888	2.05E+12	0.6124725
GB	United Kingdom	2004	41580064154	2.42E+12	0.54618
GB	United Kingdom	2005	-92742954100	2.54E+12	0.549998333
GB	United Kingdom	2006	-61381481566	2.71E+12	0.543486667
GB	United Kingdom	2007	1.6088E+11	3.1E+12	0.499771667
GB	United Kingdom	2008	1.03242E+11	2.92E+12	0.54396625
GB	United Kingdom	2009	-62945021961	2.41E+12	0.641919263
GB	United Kingdom	2010	-12327098017	2.48E+12	0.647179346
GB	United Kingdom	2011	53821554015	2.66E+12	0.624140836
GB	United Kingdom	2012	-34727249184	2.7E+12	0.633046989
GB	United Kingdom	2013	-8222267228	2.79E+12	0.639660578
GB	United Kingdom	2014	-1.72806E+11	3.06E+12	0.607729627
GB	United Kingdom	2015	-1.0551E+11	2.93E+12	0.654545479
GB	United Kingdom	2016	-2.91905E+11	2.69E+12	0.740634464
GB	United Kingdom	2017	16784925643	2.67E+12	0.776976682
GB	United Kingdom	2018	-917914118.8	2.86E+12	0.74953154
GB	United Kingdom	2019	NA	NA	NA
ID	Indonesia	1982	-2.25E+08	9.02E+10	661.42075
ID	Indonesia	1983	-2.92E+08	8.11E+10	909.2648333
ID	Indonesia	1984	-2.22E+08	8.49E+10	1025.944833
ID	Indonesia	1985	-3.10E+08	8.53E+10	1110.58
ID	Indonesia	1986	-2.58E+08	8E+10	1282.56
ID	Indonesia	1987	-3.85E+08	7.59E+10	1643.848333
ID	Indonesia	1988	-5.76E+08	8.43E+10	1685.704167
ID	Indonesia	1989	-6.82E+08	9.45E+10	1770.059167
ID	Indonesia	1990	-1.09E+09	1.06E+11	1842.813333
ID	Indonesia	1991	-1.48E+09	1.17E+11	1950.3175
ID	Indonesia	1992	-1.78E+09	1.28E+11	2029.920833
ID	Indonesia	1993	-1.65E+09	1.58E+11	2087.103867
ID	Indonesia	1994	-1.50E+09	1.77E+11	2160.753675
ID	Indonesia	1995	-3.74E+09	2.02E+11	2248.607975
ID	Indonesia	1996	-5.59E+09	2.27E+11	2342.296292
ID	Indonesia	1997	-4.50E+09	2.16E+11	2909.38
ID	Indonesia	1998	240800000	9.54E+10	10013.6225
ID	Indonesia	1999	1865620963	1.4E+11	7855.15
ID	Indonesia	2000	4550355286	1.65E+11	8421.775
ID	Indonesia	2001	2977391857	1.6E+11	10260.85
ID	Indonesia	2002	-145085548.7	1.96E+11	9311.191667
ID	Indonesia	2003	596923827.8	2.35E+11	8577.133333
ID	Indonesia	2004	1511917230	2.57E+11	8938.85
ID	Indonesia	2005	-5271257208	2.86E+11	9704.741667
ID	Indonesia	2006	-2188448467	3.65E+11	9159.316667
ID	Indonesia	2007	-2253330000	4.32E+11	9141
ID	Indonesia	2008	-3418723399	5.1E+11	9698.9625
ID	Indonesia	2009	-2628247483	5.4E+11	10389.9375
ID	Indonesia	2010	-11106333135	7.55E+11	9090.433333
ID	Indonesia	2011	-11528394762	8.93E+11	8770.433333
ID	Indonesia	2012	-13716225988	9.18E+11	9386.629167
ID	Indonesia	2013	-12170055179	9.13E+11	10461.24
ID	Indonesia	2014	-14733198283	8.91E+11	11865.2113
ID	Indonesia	2015	-10704478317	8.61E+11	13389.41294
ID	Indonesia	2016	-16135916019	9.32E+11	13308.3268
ID	Indonesia	2017	-18502038861	1.02E+12	13380.83388
ID	Indonesia	2018	-13421979939	1.04E+12	14236.93877
ID	Indonesia	2019	NA	NA	NA
IN	India	1982	NA	2.01E+11	9.455131933
IN	India	1983	NA	2.18E+11	10.09889824
IN	India	1984	NA	2.12E+11	11.36258333
IN	India	1985	NA	2.33E+11	12.36875
IN	India	1986	NA	2.49E+11	12.61083333
IN	India	1987	NA	2.79E+11	12.9615
IN	India	1988	NA	2.97E+11	13.91708333
IN	India	1989	NA	2.96E+11	16.2255

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IN	India	1990	NA	3.21E+11	17.5035
IN	India	1991	-73537638.39	2.7E+11	22.74243333
IN	India	1992	-276512439	2.88E+11	25.91808333
IN	India	1993	-550019384.4	2.79E+11	30.49329167
IN	India	1994	-890688166	3.27E+11	31.3737425
IN	India	1995	-2026439031	3.6E+11	32.42707667
IN	India	1996	-2186732315	3.93E+11	35.43317333
IN	India	1997	-3464411052	4.16E+11	36.31328583
IN	India	1998	-2587058630	4.21E+11	41.259365
IN	India	1999	-2089233597	4.59E+11	43.05542833
IN	India	2000	-3074684332	4.68E+11	44.941605
IN	India	2001	-4073961343	4.85E+11	47.18641417
IN	India	2002	-3947895992	5.15E+11	48.61031917
IN	India	2003	-2444138426	6.08E+11	46.58328417
IN	India	2004	-3592188066	7.09E+11	45.31646667
IN	India	2005	-4628652265	8.2E+11	44.099975
IN	India	2006	-5992285935	9.4E+11	45.30700833
IN	India	2007	-8201628958	1.22E+12	41.34853333
IN	India	2008	-24149749830	1.2E+12	43.50518333
IN	India	2009	-19485789183	1.34E+12	48.40526667
IN	India	2010	-11428785746	1.68E+12	45.72581212
IN	India	2011	-23890659988	1.82E+12	46.67046667
IN	India	2012	-15442447343	1.83E+12	53.43723333
IN	India	2013	-26388082470	1.86E+12	58.59784542
IN	India	2014	-22890162761	2.04E+12	61.02951446
IN	India	2015	-36495216491	2.1E+12	64.15194446
IN	India	2016	-39411278940	2.29E+12	67.19531281
IN	India	2017	-28875941053	2.65E+12	65.12156865
IN	India	2018	-30699661201	2.72E+12	68.38946709
IN	India	2019	NA	NA	NA
IT	Italy	1982	345749571.5	4.27E+11	1352.51
IT	Italy	1983	828615354.9	4.43E+11	1518.848333
IT	Italy	1984	567836894	4.38E+11	1756.960833
IT	Italy	1985	673853049	4.52E+11	1909.439167
IT	Italy	1986	2605984591	6.4E+11	1490.81
IT	Italy	1987	-2101110972	8.06E+11	1296.07
IT	Italy	1988	-2097581266	8.92E+11	1301.6275
IT	Italy	1989	-50705837.94	9.29E+11	1372.093333
IT	Italy	1990	1005044783	1.18E+12	1198.101667
IT	Italy	1991	5209240508	1.25E+12	1240.613333
IT	Italy	1992	1170141468	1.32E+12	1232.405833
IT	Italy	1993	3487994303	1.06E+12	1573.665867
IT	Italy	1994	3038264200	1.1E+12	1612.444983
IT	Italy	1995	2157553236	1.17E+12	1628.933158
IT	Italy	1996	5158060152	1.31E+12	1542.946967
IT	Italy	1997	6714677949	1.24E+12	1703.096908
IT	Italy	1998	9814894093	1.27E+12	1736.207383
IT	Italy	1999	-6679306476	1.25E+12	NA
IT	Italy	2000	-6680942868	1.14E+12	NA
IT	Italy	2001	1491397213	1.17E+12	NA
IT	Italy	2002	-5734722572	1.27E+12	NA
IT	Italy	2003	-17428472837	1.57E+12	NA
IT	Italy	2004	-5787691393	1.8E+12	NA
IT	Italy	2005	15534759450	1.86E+12	NA
IT	Italy	2006	1965501866	1.95E+12	NA
IT	Italy	2007	54017799729	2.21E+12	NA
IT	Italy	2008	77205263867	2.4E+12	NA
IT	Italy	2009	1761981448	2.19E+12	NA
IT	Italy	2010	20797381623	2.13E+12	NA
IT	Italy	2011	17407209146	2.29E+12	NA
IT	Italy	2012	6761845951	2.09E+12	NA
IT	Italy	2013	744256584.5	2.14E+12	NA
IT	Italy	2014	3383852594	2.16E+12	NA
IT	Italy	2015	2437791009	1.84E+12	NA
IT	Italy	2016	-11593838477	1.88E+12	NA
IT	Italy	2017	676832040.6	1.96E+12	NA
IT	Italy	2018	224517518.8	2.08E+12	NA
IT	Italy	2019	NA	NA	NA
JP	Japan	1982	NA	1.13E+12	249.0766667
JP	Japan	1983	NA	1.24E+12	237.5116667
JP	Japan	1984	NA	1.32E+12	237.5225
JP	Japan	1985	NA	1.4E+12	238.5358333
JP	Japan	1986	NA	2.08E+12	168.5198333

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JP	Japan	1987	NA		2.53E+12	144.6375
JP	Japan	1988	NA		3.07E+12	128.1516667
JP	Japan	1989	NA		3.05E+12	137.9644167
JP	Japan	1990	NA		3.13E+12	144.7925
JP	Japan	1991	NA		3.58E+12	134.7066667
JP	Japan	1992	NA		3.91E+12	126.6513333
JP	Japan	1993	NA		4.45E+12	111.1977858
JP	Japan	1994	NA		4.91E+12	102.2078058
JP	Japan	1995	NA		5.45E+12	94.05957917
JP	Japan	1996	26440694397		4.83E+12	108.7790567
JP	Japan	1997	21500257091		4.41E+12	120.9908625
JP	Japan	1998	17293070283		4.03E+12	130.9053007
JP	Japan	1999	9481358284		4.56E+12	113.906805
JP	Japan	2000	34339324666		4.89E+12	107.7654983
JP	Japan	2001	30734354196		4.3E+12	121.5289475
JP	Japan	2002	19344378431		4.12E+12	125.3880192
JP	Japan	2003	25693039712		4.45E+12	115.9334642
JP	Japan	2004	33085785004		4.82E+12	108.1925692
JP	Japan	2005	46205395350		4.76E+12	110.2182117
JP	Japan	2006	60549386567		4.53E+12	116.2993117
JP	Japan	2007	51358484681		4.52E+12	117.7535292
JP	Japan	2008	89018788218		5.04E+12	103.359494
JP	Japan	2009	61450645281		5.23E+12	93.57008909
JP	Japan	2010	72215534552		5.7E+12	87.779875
JP	Japan	2011	1.17686E+11		6.16E+12	79.80701983
JP	Japan	2012	1.17085E+11		6.2E+12	79.79045542
JP	Japan	2013	1.45036E+11		5.16E+12	97.59565828
JP	Japan	2014	1.18172E+11		4.85E+12	105.944781
JP	Japan	2015	1.33163E+11		4.39E+12	121.0440257
JP	Japan	2016	1.37656E+11		4.93E+12	108.7929
JP	Japan	2017	1.53419E+11		4.86E+12	112.1661411
JP	Japan	2018	1.33222E+11		4.97E+12	110.4231793
JP	Japan	2019	NA	NA	NA	NA
KR	Korea, Rep.	1982	63100000		7.78E+10	731.0841667
KR	Korea, Rep.	1983	-15400000		8.7E+10	775.7483333
KR	Korea, Rep.	1984	-132800000		9.66E+10	805.9758333
KR	Korea, Rep.	1985	252500000		1E+11	870.02
KR	Korea, Rep.	1986	586600000		1.16E+11	881.4541667
KR	Korea, Rep.	1987	-294300000		1.46E+11	822.5675
KR	Korea, Rep.	1988	-567100000		1.97E+11	731.4683333
KR	Korea, Rep.	1989	-660100000		2.44E+11	671.4558333
KR	Korea, Rep.	1990	87600000		2.79E+11	707.7641667
KR	Korea, Rep.	1991	1.36E+08		3.26E+11	733.3533333
KR	Korea, Rep.	1992	374100000		3.5E+11	780.6508333
KR	Korea, Rep.	1993	611200000		3.86E+11	802.6708333
KR	Korea, Rep.	1994	1453500000		4.56E+11	803.4458333
KR	Korea, Rep.	1995	1381400000		5.56E+11	771.2733333
KR	Korea, Rep.	1996	2170700000		5.98E+11	804.4533333
KR	Korea, Rep.	1997	1110200000		5.58E+11	951.2891667
KR	Korea, Rep.	1998	-1768900000		3.74E+11	1401.436667
KR	Korea, Rep.	1999	-6759100000		4.85E+11	1188.816667
KR	Korea, Rep.	2000	-6667300000		5.62E+11	1130.9575
KR	Korea, Rep.	2001	-3778800000		5.33E+11	1290.994583
KR	Korea, Rep.	2002	-2037900000		6.09E+11	1251.088333
KR	Korea, Rep.	2003	-1991200000		6.81E+11	1191.614167
KR	Korea, Rep.	2004	-6098800000		7.65E+11	1145.319167
KR	Korea, Rep.	2005	-5313200000		8.98E+11	1024.116667
KR	Korea, Rep.	2006	3401200000		1.01E+12	954.7905158
KR	Korea, Rep.	2007	13004100000		1.12E+12	929.2572617
KR	Korea, Rep.	2008	8.35E+09		1E+12	1102.046667
KR	Korea, Rep.	2009	8378600000		9.02E+11	1276.93
KR	Korea, Rep.	2010	18724200000		1.09E+12	1156.060988
KR	Korea, Rep.	2011	19874700000		1.2E+12	1108.292125
KR	Korea, Rep.	2012	21102800000		1.22E+12	1126.470826
KR	Korea, Rep.	2013	15551200000		1.31E+12	1094.852917
KR	Korea, Rep.	2014	18724900000		1.41E+12	1052.960833
KR	Korea, Rep.	2015	1.96E+10		1.38E+12	1131.1575
KR	Korea, Rep.	2016	17785200000		1.41E+12	1160.433435
KR	Korea, Rep.	2017	16156500000		1.53E+12	1130.424621
KR	Korea, Rep.	2018	24437900000		1.62E+12	1100.5
KR	Korea, Rep.	2019	NA	NA	NA	NA
MX	Mexico	1982	-1.90E+09		1.85E+11	0.0564017
MX	Mexico	1983	-2.19E+09		1.56E+11	0.120093583
MX	Mexico	1984	-1.54E+09		1.84E+11	0.167827583

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MX	Mexico	1985	-1.98E+09	1.95E+11	0.256871583
MX	Mexico	1986	-2.40E+09	1.35E+11	0.611772583
MX	Mexico	1987	-2.63E+09	1.48E+11	1.3781825
MX	Mexico	1988	-2.88E+09	1.82E+11	2.273105
MX	Mexico	1989	-3.17E+09	2.21E+11	2.4614725
MX	Mexico	1990	-2.63E+09	2.61E+11	2.812599167
MX	Mexico	1991	-4.76E+09	3.13E+11	3.01843
MX	Mexico	1992	-4.39E+09	3.63E+11	3.094898333
MX	Mexico	1993	-4.39E+09	5.01E+11	3.115616667
MX	Mexico	1994	-10972500000	5.28E+11	3.375116667
MX	Mexico	1995	-9526290000	3.6E+11	6.419425
MX	Mexico	1996	-9185600000	4.11E+11	7.599448417
MX	Mexico	1997	-12829800000	5E+11	7.91846
MX	Mexico	1998	-12756764558	5.27E+11	9.13604175
MX	Mexico	1999	-13941043232	6E+11	9.5603975
MX	Mexico	2000	-18382284821	7.08E+11	9.455583333
MX	Mexico	2001	-25656063323	7.57E+11	9.342341667
MX	Mexico	2002	-23164330414	7.72E+11	9.655958333
MX	Mexico	2003	-16970050154	7.29E+11	10.78901917
MX	Mexico	2004	-20484147695	7.82E+11	11.28596667
MX	Mexico	2005	-19544163986	8.77E+11	10.89789167
MX	Mexico	2006	-15342661546	9.75E+11	10.89924167
MX	Mexico	2007	-22775490400	1.05E+12	10.92819167
MX	Mexico	2008	-29034003375	1.11E+12	11.12971667
MX	Mexico	2009	-8100214383	9E+11	13.513475
MX	Mexico	2010	-12857142703	1.06E+12	12.63600833
MX	Mexico	2011	-12302147142	1.18E+12	12.423325
MX	Mexico	2012	1003361012	1.2E+12	13.16945833
MX	Mexico	2013	-33591244875	1.27E+12	12.77199167
MX	Mexico	2014	-25058678494	1.31E+12	13.29245
MX	Mexico	2015	-25259192297	1.17E+12	15.84826667
MX	Mexico	2016	-30417743907	1.08E+12	18.66405833
MX	Mexico	2017	-29592911671	1.16E+12	18.92651667
MX	Mexico	2018	-26701473344	1.22E+12	19.24434167
MX	Mexico	2019	NA	NA	NA
RU	Russian Federation	1982	NA	NA	NA
RU	Russian Federation	1983	NA	NA	NA
RU	Russian Federation	1984	NA	NA	NA
RU	Russian Federation	1985	NA	NA	NA
RU	Russian Federation	1986	NA	NA	NA
RU	Russian Federation	1987	NA	NA	NA
RU	Russian Federation	1988	NA	5.55E+11	NA
RU	Russian Federation	1989	NA	5.07E+11	NA
RU	Russian Federation	1990	NA	5.17E+11	NA
RU	Russian Federation	1991	NA	5.18E+11	NA
RU	Russian Federation	1992	NA	4.6E+11	NA
RU	Russian Federation	1993	NA	4.35E+11	0.991666667
RU	Russian Federation	1994	-378600000	3.95E+11	NA
RU	Russian Federation	1995	-1459950000	3.96E+11	NA
RU	Russian Federation	1996	-1656490000	3.92E+11	5.120833333
RU	Russian Federation	1997	-1680740000	4.05E+11	5.784833333
RU	Russian Federation	1998	-1551610000	2.71E+11	9.705083333
RU	Russian Federation	1999	-1061410000	1.96E+11	24.6199
RU	Russian Federation	2000	500800000	2.6E+11	28.12916667
RU	Russian Federation	2001	-306270000	3.07E+11	29.168525
RU	Russian Federation	2002	58820000	3.45E+11	31.34848333
RU	Russian Federation	2003	1795350000	4.3E+11	30.692025
RU	Russian Federation	2004	-1620960000	5.91E+11	28.81374167
RU	Russian Federation	2005	2371590000	7.64E+11	28.28444167
RU	Russian Federation	2006	-7601620000	9.9E+11	27.19095833
RU	Russian Federation	2007	-11072470000	1.3E+12	25.58084537
RU	Russian Federation	2008	-19120290000	1.66E+12	24.852875
RU	Russian Federation	2009	6697430000	1.22E+12	31.74035833
RU	Russian Federation	2010	9448500000	1.52E+12	30.36791534
RU	Russian Federation	2011	11767160000	2.05E+12	29.38234137
RU	Russian Federation	2012	-1765140000	2.21E+12	30.83983135
RU	Russian Federation	2013	17287630000	2.3E+12	31.83714364
RU	Russian Federation	2014	35050840000	2.06E+12	38.37820714
RU	Russian Federation	2015	15232100000	1.36E+12	60.93765011
RU	Russian Federation	2016	-10224570000	1.28E+12	67.05593333
RU	Russian Federation	2017	8199580000	1.58E+12	58.34280119
RU	Russian Federation	2018	22592030000	1.66E+12	62.66813333
RU	Russian Federation	2019	NA	NA	NA
SA	Saudi Arabia	1982	-11128383580	1.53E+11	3.428170832
SA	Saudi Arabia	1983	-4943904678	1.29E+11	3.454759166

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SA	Saudi Arabia	1984	-4849863063	1.2E+11	3.523810833
SA	Saudi Arabia	1985	-491422763.2	1.04E+11	3.622135833
SA	Saudi Arabia	1986	-965935919.1	8.7E+10	3.70625
SA	Saudi Arabia	1987	1173333333	8.57E+10	3.75
SA	Saudi Arabia	1988	3.28E+08	8.83E+10	3.75
SA	Saudi Arabia	1989	653333333.3	9.53E+10	3.75
SA	Saudi Arabia	1990	-1861333333	1.18E+11	3.75
SA	Saudi Arabia	1991	-1.60E+08	1.32E+11	3.75
SA	Saudi Arabia	1992	789333333.33	1.37E+11	3.75
SA	Saudi Arabia	1993	-1367200000	1.33E+11	3.75
SA	Saudi Arabia	1994	-349333333.3	1.35E+11	3.75
SA	Saudi Arabia	1995	1874666667	1.43E+11	3.75
SA	Saudi Arabia	1996	1127466667	1.59E+11	3.75
SA	Saudi Arabia	1997	-3039466667	1.66E+11	3.75
SA	Saudi Arabia	1998	-4283466667	1.47E+11	3.75
SA	Saudi Arabia	1999	778933333.3	1.62E+11	3.75
SA	Saudi Arabia	2000	1881066667	1.9E+11	3.75
SA	Saudi Arabia	2001	-19640000	1.84E+11	3.75
SA	Saudi Arabia	2002	614133333.3	1.9E+11	3.75
SA	Saudi Arabia	2003	586506666.7	2.16E+11	3.75
SA	Saudi Arabia	2004	334320000	2.59E+11	3.75
SA	Saudi Arabia	2005	-12447200000	3.28E+11	3.75
SA	Saudi Arabia	2006	-18331733333	3.77E+11	3.75
SA	Saudi Arabia	2007	-24453386667	4.16E+11	3.75
SA	Saudi Arabia	2008	-35958243929	5.2E+11	3.75
SA	Saudi Arabia	2009	-34280396667	4.29E+11	3.75
SA	Saudi Arabia	2010	-25325858000	5.28E+11	3.75
SA	Saudi Arabia	2011	-12878361333	6.71E+11	3.75
SA	Saudi Arabia	2012	-7780825000	7.36E+11	3.75
SA	Saudi Arabia	2013	-3921400000	7.47E+11	3.75
SA	Saudi Arabia	2014	-2615796667	7.56E+11	3.75
SA	Saudi Arabia	2015	-2751098333	6.54E+11	3.75
SA	Saudi Arabia	2016	1483622000	6.45E+11	3.75
SA	Saudi Arabia	2017	5860755582	6.89E+11	3.75
SA	Saudi Arabia	2018	18740259934	7.87E+11	3.75
SA	Saudi Arabia	2019	NA	NA	NA
TR	Turkey	1982	-5.50E+07	6.45E+10	0.000162553
TR	Turkey	1983	-4.60E+07	6.17E+10	0.000225457
TR	Turkey	1984	-1.13E+08	6E+10	0.000366678
TR	Turkey	1985	-9.90E+07	6.72E+10	0.000521983
TR	Turkey	1986	-1.25E+08	7.57E+10	0.000674512
TR	Turkey	1987	-1.06E+08	8.72E+10	0.000857214
TR	Turkey	1988	-3.54E+08	9.09E+10	0.001422346
TR	Turkey	1989	-6.63E+08	1.07E+11	0.002121679
TR	Turkey	1990	-7.00E+08	1.51E+11	0.002608642
TR	Turkey	1991	-7.83E+08	1.5E+11	0.004171816
TR	Turkey	1992	-7.79E+08	1.58E+11	0.006872423
TR	Turkey	1993	-6.22E+08	1.8E+11	0.010984628
TR	Turkey	1994	-5.59E+08	1.31E+11	0.029608676
TR	Turkey	1995	-7.72E+08	1.69E+11	0.045845061
TR	Turkey	1996	-6.12E+08	1.81E+11	0.081404892
TR	Turkey	1997	-5.54E+08	1.9E+11	0.151865
TR	Turkey	1998	-5.73E+08	2.76E+11	0.26072425
TR	Turkey	1999	-1.38E+08	2.56E+11	0.418782917
TR	Turkey	2000	-1.12E+08	2.73E+11	0.6252185
TR	Turkey	2001	-2.86E+09	2E+11	1.225588083
TR	Turkey	2002	-9.39E+08	2.38E+11	1.507226417
TR	Turkey	2003	-1.22E+09	3.12E+11	1.500885209
TR	Turkey	2004	-2.01E+09	4.05E+11	1.42553725
TR	Turkey	2005	-8.97E+09	5.01E+11	1.343583108
TR	Turkey	2006	-1.93E+10	5.52E+11	1.428453413
TR	Turkey	2007	-1.99E+10	6.76E+11	1.302930905
TR	Turkey	2008	-1.73E+10	7.64E+11	1.301521703
TR	Turkey	2009	-7.03E+09	6.45E+11	1.549959776
TR	Turkey	2010	-7.62E+09	7.72E+11	1.50284863
TR	Turkey	2011	-1.38E+10	8.33E+11	1.674954552
TR	Turkey	2012	-9.64E+09	8.74E+11	1.796000944
TR	Turkey	2013	-9.93E+09	9.51E+11	1.903768242
TR	Turkey	2014	-6.29E+09	9.34E+11	2.188542418
TR	Turkey	2015	-1.42E+10	8.6E+11	2.720008528
TR	Turkey	2016	-1.08E+10	8.64E+11	3.020134748
TR	Turkey	2017	-8.85E+09	8.53E+11	3.648132635
TR	Turkey	2018	-9.41E+09	7.71E+11	4.828370147
TR	Turkey	2019	NA	NA	NA
US	United States	1982	-1.35E+10	3.34E+12	1

US	United States	1983	-2.73E+09	3.63E+12	1
US	United States	1984	-1.24E+10	4.04E+12	1
US	United States	1985	-5.95E+09	4.34E+12	1
US	United States	1986	-1.14E+10	4.58E+12	1
US	United States	1987	-2.34E+10	4.86E+12	1
US	United States	1988	-3.52E+10	5.24E+12	1
US	United States	1989	-2.48E+10	5.64E+12	1
US	United States	1990	-1.13E+10	5.96E+12	1
US	United States	1991	1.47E+10	6.16E+12	1
US	United States	1992	2.85E+10	6.52E+12	1
US	United States	1993	3.26E+10	6.86E+12	1
US	United States	1994	3.41E+10	7.29E+12	1
US	United States	1995	4.10E+10	7.64E+12	1
US	United States	1996	5.36E+09	8.07E+12	1
US	United States	1997	-7.70E+08	8.58E+12	1
US	United States	1998	-3.64E+10	9.06E+12	1
US	United States	1999	-6.50E+10	9.63E+12	1
US	United States	2000	-1.63E+11	1.03E+13	1
US	United States	2001	-2.65E+10	1.06E+13	1
US	United States	2002	6.79E+10	1.09E+13	1
US	United States	2003	7.81E+10	1.15E+13	1
US	United States	2004	1.60E+11	1.22E+13	1
US	United States	2005	-8.98E+10	1.3E+13	1
US	United States	2006	-1.47E+10	1.38E+13	1
US	United States	2007	1.77E+11	1.45E+13	1
US	United States	2008	2491000000	1.47E+13	1
US	United States	2009	1.52E+11	1.44E+13	1
US	United States	2010	8.58E+10	1.5E+13	1
US	United States	2011	1.73E+11	1.55E+13	1
US	United States	2012	1.27E+11	1.62E+13	1
US	United States	2013	1.05E+11	1.68E+13	1
US	United States	2014	1.36E+11	1.75E+13	1
US	United States	2015	-2.02E+11	1.82E+13	1
US	United States	2016	-1.76E+11	1.87E+13	1
US	United States	2017	2.99E+10	1.95E+13	1
US	United States	2018	-3.37E+11	2.05E+13	1
US	United States	2019	NA	NA	NA
ZA	South Africa	1982	NA	7.84E+10	1.085815833
ZA	South Africa	1983	NA	8.74E+10	1.1141
ZA	South Africa	1984	NA	7.73E+10	1.4752775
ZA	South Africa	1985	500000438.4	5.91E+10	2.228674999
ZA	South Africa	1986	121467409.7	6.75E+10	2.285031666
ZA	South Africa	1987	303792686.7	8.86E+10	2.036033333
ZA	South Africa	1988	-93871059.93	9.52E+10	2.2734675
ZA	South Africa	1989	363907985.5	9.9E+10	2.6226775
ZA	South Africa	1990	103696633.4	1.16E+11	2.587320833
ZA	South Africa	1991	-47695824.16	1.24E+11	2.761315
ZA	South Africa	1992	1935669470	1.35E+11	2.852014167
ZA	South Africa	1993	280623702.5	1.34E+11	3.267741583
ZA	South Africa	1994	886096104	1.4E+11	3.550798333
ZA	South Africa	1995	1245489079	1.55E+11	3.627085
ZA	South Africa	1996	231585202.3	1.48E+11	4.299349167
ZA	South Africa	1997	-1486940325	1.53E+11	4.607961667
ZA	South Africa	1998	1083666643	1.38E+11	5.528284167
ZA	South Africa	1999	80850625.99	1.37E+11	6.109484167
ZA	South Africa	2000	-691652738.6	1.36E+11	6.939828333
ZA	South Africa	2001	-10785077716	1.22E+11	8.609180833
ZA	South Africa	2002	-1882067010	1.15E+11	10.54074667
ZA	South Africa	2003	-230592460	1.75E+11	7.564749167
ZA	South Africa	2004	604002318.6	2.29E+11	6.4596925
ZA	South Africa	2005	-5612683803	2.58E+11	6.359328333
ZA	South Africa	2006	5305504771	2.72E+11	6.771549167
ZA	South Africa	2007	-3604679769	2.99E+11	7.045365
ZA	South Africa	2008	-12004584138	2.87E+11	8.261223333
ZA	South Africa	2009	-6313190334	2.96E+11	8.473674158
ZA	South Africa	2010	-3854564952	3.75E+11	7.321221961
ZA	South Africa	2011	-4292687424	4.16E+11	7.261132132
ZA	South Africa	2012	-1727159492	3.96E+11	8.209968627
ZA	South Africa	2013	-1712645458	3.67E+11	9.655056069
ZA	South Africa	2014	1900417869	3.51E+11	10.85265557
ZA	South Africa	2015	3993788901	3.18E+11	12.75893088
ZA	South Africa	2016	2275171115	2.96E+11	14.70961089
ZA	South Africa	2017	5390643573	3.5E+11	13.32380142
ZA	South Africa	2018	-923169637.8	3.68E+11	13.23392647
ZA	South Africa	2019	NA	NA	NA

Source: Actual Data of FDI,GDP and Official Exchange Rate of G20 Countries from 1982 to 2018 as obtained from world bank database.

The whole process of determining the relationship among FDI, GDP and Foreign Exchange Rate involves application of two predictive analytics techniques i.e. Multiple Linear Regression equation and Time Series Forecasting.

Multiple Linear Regression (i.e. $Y=C+mx+e$) equation has been applied under two scenarios:

- 1) when GDP depends on FDI (i.e. $GDP = \text{intercept} + \text{coefficients} * \text{FDI} + \text{error}$)
- 2) when Foreign Exchange Rate depends on FDI (i.e. $GDP = \text{intercept} + \text{coefficients} * \text{FDI} + \text{error}$)

Application of Multiple Linear Regression equation has been done through the following steps:

- 1) Detection and elimination of outliers of the dependent variables i.e. GDP and Foreign Exchange Rate.
- 2) Checking and replacement of missing value in the whole data set.
- 3) Application of code for Multiple Linear Regression equation on the whole dataset.
- 4) Extraction of intercept, coefficients, P-values of T-test and adjusted R squared country-wise and scenarios-wise.

Table 3. below shows details about multinomial linear regression when GDP depends on FDI for all G20 countries

	Intercept	FDI	Adj.R.Squared	P-value Fstatistics
Argentina	1.75745E+11	-2.22E+01	0.367551017	4.1756E-05
Australia	3.91971E+11	-1.98E+01	0.796285835	2.14536E-11
Brazil	4.27518E+11	-2.51E+01	0.809831574	2.18E-14
Canada	9.35455E+11	6.10E+00	0.015240022	0.22037
China	1.44433E+12	-3.33E+01	0.268572531	0.000602548
France	1.52647E+12	9.96E+00	0.123328784	0.018859041
Germany	2.12962E+12	1.24E+01	0.234559234	0.001405499
India	3.93202E+11	-5.92E+01	0.846512787	2.68E-12
Indonesia	1.55945E+11	-5.21E+01	0.844050589	6.66111E-16
Italy	1.36462E+12	1.50E+01	0.14940938	0.010447087
Japan	4.43893E+12	5.80E+00	0.220448769	0.01379378
Korea, Rep.	4.93658E+11	4.20E+01	0.654633193	8.23568E-10
Mexico	2.73462E+11	-3.00E+01	0.588779398	1.83E-08
Russian Federation	9.60171E+11	2.72E+01	0.158350863	0.027814522
Saudi Arabia	2.9503E+11	-3.91E+00	0.002944882	0.300089449
South Africa	2.09313E+11	-3.40E+00	-0.017677037	0.518234889
Turkey	1.94572E+11	-4.24E+01	0.648035998	1.15E-09
United Kingdom	1.80105E+12	-2.40E+00	0.019660867	0.197978839
United States	1.06947E+13	-1.84E+00	-0.027061777	8.22E-01

Table 4. below shows details about multinomial linear regression when Foreign Exchange Rate depends on FDI for all G20 countries

	Intercept	FDI	Adj.R.Squared	P-value Fstatistics
Argentina	1.6495165	-3.89E-10	0.083173684	0.046352255
Australia	1.459500834	6.14E-12	0.297993498	0.001069672
Brazil	0.78686726	-2.77E-11	0.375943926	3.27E-05
Canada	1.260108693	1.02E-12	-0.014517659	0.490835346
China	5.679841183	-1.03E-11	0.086816741	0.042727253
France	6.641040308	-6.30E-11	0.089734423	0.129249956
Germany	2.213722851	-1.51E-11	0.253404592	0.022828376
India	36.21283806	-8.22E-10	0.694949617	2.20E-08
Indonesia	4818.860389	-4.30E-07	0.299101795	0.000273973
Italy	1437.473922	2.67E-08	0.096474027	0.120607702
Japan	117.4932871	-1.24E-10	0.164628518	0.031149857
Korea, Rep.	961.3427554	5.78E-09	0.043982628	0.112114098
Mexico	2.349526751	-4.44E-10	0.622598658	3.98E-09
Russian Federation	30.62284863	4.98E-10	0.087178089	0.092796198
Saudi Arabia	3.724115032	3.20E-13	-0.026672036	0.800626624
South Africa	6.596369926	-2.49E-11	-0.030570895	0.885453752
Turkey	0.426279281	-1.22E-10	0.37804486	3.08E-05
United Kingdom	0.632591946	-2.04E-13	0.029022506	0.158514991
United States	1	-3.12E-28	0.487723475	9.28E-07

Table 5. Below is shown the country wise ARIMA Model MAPE

Argentina	162.486
Australia	157.5423
Brazil	206.7669
Canada	100
China	38.52622
Germany	89.33746
France	601.1116
United Kingdom	100
Indonesia	148.3527
India	34.14024
Italy	100
Japan	26.64847
Korea Rep.	230.161
Mexico	62.41955
Russian Federation	100
Saudi Arabia	100
Turkey	96.01256
United States	100
South Africa	288.3027

Both the above tables have four columns which are intercept, coefficients (with respect to unit change in independent variable i.e. FDI), Adjusted R squared (to show the robustness of the model), P-value of F statistics (to show how better the model is rather than an intercept only model). An attempt has been made to apply ARIMA Models on country-wise data to forecast, but due to huge MAPE (Mean Absolute Percentage Error), application of ARIMA has been rejected. Though the data was stationary as per Augmented Dickey-Fuller Test.

So, alternatively a substitute model has been built where FDI depends on year change (here it is indicated as year_rep). The details of the model is given in the following Table 6. So, using coefficients and intercept of all three multinomial linear regression (GDP~FDI, ER~ER, FDI~year change), forecast can be done for GDP, Official Exchange Rate and FDI for 2019,2020,2012,2022. The forecasted Table:7, is presented below.

Table 6.

	Intercept	year_rep	Adj.R.Squared	P-value Fstatistics
Argentina	-469439433.3	-244099480.7	0.287203	0.000373749
Australia	21897377596	-1887485115	0.625735	1.19E-07
Brazil	13459117719	-2083411867	0.650565	1.01E-09
Canada	-3942229629	495095978.3	0.065637	0.068657233
China	15269706370	-4078947844	0.423622	7.76E-06
France	3567955164	1144626481	0.148082	0.010768133
Germany	-2141788199	1513326076	0.136517	0.014003208
India	18239321447	-1333268005	0.777966	3.38E-10
Indonesia	3128419981	-399727091.2	0.519222	2.98E-07
Italy	-112323502.1	290074920.5	0.008688	0.259177558
Japan	-97847300104	6790673846	0.879748	2.45E-11
Korea, Rep.	-6243977809	612976695.1	0.513711	3.65E-07
Mexico	-147880478.6	-740022527.9	0.608316	7.69E-09
Russian Federation	-14129970615	707918292.3	0.177099	0.020758668
Saudi Arabia	-1837282288	-166230442.1	-8.41E-06	0.324246579
South Africa	-131876165.9	-36460177.94	-0.02144	0.583123653
Turkey	2565611664	-409523470.8	0.519756	2.92E-07
United Kingdom	39918328231	-2117228107	0.058595	0.080453302
United States	4571527738	43982693.22	-0.02855	0.979036485

year	country	FDI	GDP	ER
2019	Argentina	-9501120218	3.86258E+11	5.343540398
2020	Argentina	-9745219699	3.91667E+11	5.438445977
2021	Argentina	-9989319179	3.97075E+11	5.533351556
2022	Argentina	-10233418660	4.02484E+11	5.628257135
2019	Australia	-47939571674	1.34333E+12	1.165100303
2020	Australia	-49827056789	1.38079E+12	1.153509114
2021	Australia	-51714541904	1.41824E+12	1.141917925
2022	Australia	-53602027020	1.4557E+12	1.130326737
2019	Brazil	-63627121374	2.0221E+12	2.547541092
2020	Brazil	-65710533242	2.07432E+12	2.605192746
2021	Brazil	-67793945109	2.12653E+12	2.662844399
2022	Brazil	-69877356976	2.17874E+12	2.720496053
2019	Canada	14376321567	1.0231E+12	1.274702239
2020	Canada	14871417545	1.02612E+12	1.275204816
2021	Canada	15366513524	1.02914E+12	1.275707393
2022	Canada	15861609502	1.03216E+12	1.27620997
2019	China	-1.35651E+11	5.96278E+12	7.080680547
2020	China	-1.3973E+11	6.09865E+12	7.122802871
2021	China	-1.43809E+11	6.23452E+12	7.164925195
2022	China	-1.47888E+11	6.37038E+12	7.207047519
2019	France	45919134958	1.9837E+12	3.748342803
2020	France	47063761439	1.9951E+12	3.67623652
2021	France	48208387920	2.00649E+12	3.604130236
2022	France	49353014401	2.01789E+12	3.532023953
2019	Germany	53851276623	2.79622E+12	1.399284115
2020	Germany	55364602700	2.81496E+12	1.376396795
2021	Germany	56877928776	2.83369E+12	1.353509475
2022	Germany	58391254852	2.85242E+12	1.330622156
2019	India	-31091594735	2.23414E+12	61.7729324
2020	India	-32424862740	2.31308E+12	62.86899892
2021	India	-33758130744	2.39202E+12	63.96506544
2022	India	-35091398749	2.47097E+12	65.06113196
2019	Indonesia	-11661482393	7.63346E+11	9835.16167
2020	Indonesia	-12061209484	7.84166E+11	10007.10821
2021	Indonesia	-12460936575	8.04986E+11	10179.05474
2022	Indonesia	-12860663666	8.25807E+11	10351.00128
2019	Italy	10620448558	1.52357E+12	1721.317569
2020	Italy	10910523478	1.52791E+12	1729.070153
2021	Italy	11200598399	1.53226E+12	1736.822738
2022	Italy	11490673319	1.5366E+12	1744.575322

.....Continue

2019	Japan	1.53408E+11	5.32918E+12	98.53604311
2020	Japan	1.60198E+11	5.36859E+12	97.69689021
2021	Japan	1.66989E+11	5.408E+12	96.8577373
2022	Japan	1.7378E+11	5.4474E+12	96.01858439
2019	Korea, Rep.	16436159910	1.18342E+12	1056.270495
2020	Korea, Rep.	17049136605	1.20915E+12	1059.810768
2021	Korea, Rep.	17662113300	1.23487E+12	1063.351041
2022	Korea, Rep.	18275089995	1.2606E+12	1066.891314
2019	Mexico	-27528714012	1.10048E+12	14.57561496
2020	Mexico	-28268736540	1.12271E+12	14.90427472
2021	Mexico	-29008759068	1.14494E+12	15.23293449
2022	Mexico	-29748781596	1.16718E+12	15.56159425
2019	Russian Federation	12063006200	1.28858E+12	36.62908411
2020	Russian Federation	12770924492	1.30785E+12	36.98156042
2021	Russian Federation	13478842785	1.32712E+12	37.33403674
2022	Russian Federation	14186761077	1.3464E+12	37.68651305
2019	Saudi Arabia	-7987808645	3.26249E+11	3.72156121
2020	Saudi Arabia	-8154039088	3.26899E+11	3.721508064
2021	Saudi Arabia	-8320269530	3.27549E+11	3.721454917
2022	Saudi Arabia	-8486499972	3.28198E+11	3.721401771
2019	South Africa	-1480902750	2.14341E+11	6.633179633
2020	South Africa	-1517362928	2.14465E+11	6.634085896
2021	South Africa	-1553823105	2.14589E+11	6.63499216
2022	South Africa	-1590283283	2.14712E+11	6.635898424
2019	Turkey	-12586756757	7.27963E+11	1.965199207
2020	Turkey	-12996280228	7.45317E+11	2.015269598
2021	Turkey	-13405803698	7.62672E+11	2.065339988
2022	Turkey	-13815327169	7.80026E+11	2.115410379
2019	United Kingdom	-38419111735	1.89333E+12	0.640441256
2020	United Kingdom	-40536339843	1.89841E+12	0.640873822
2021	United Kingdom	-42653567950	1.9035E+12	0.641306387
2022	United Kingdom	-44770796057	1.90858E+12	0.641738952
2019	United States	6198887387	1.06833E+13	1
2020	United States	6242870081	1.06833E+13	1
2021	United States	6286852774	1.06832E+13	1
2022	United States	6330835467	1.06831E+13	1

Table 8. The most adhered country to least country

	Intercept	FDI	Adj.R.Squared	P-value Fstatistics
Indonesia	1.55945E+11	-52.08610599	0.844050589	6.66E-16
Brazil	4.27518E+11	-25.06139222	0.809831574	2.18E-14
India	3.93202E+11	-59.21010276	0.846512787	2.68E-12
Australia	3.91971E+11	-19.84498462	0.796285835	2.15E-11
Korea, Rep.	4.93658E+11	41.96630225	0.654633193	8.24E-10
Turkey	1.94572E+11	-42.37712972	0.648035998	1.15E-09
Mexico	2.73462E+11	-30.04202915	0.588779398	1.83E-08
Argentina	1.75745E+11	-22.15666538	0.367551017	4.18E-05
China	1.44433E+12	-33.30929247	0.268572531	0.000602548
Germany	2.12962E+12	12.37855385	0.234559234	0.001405499
Italy	1.36462E+12	14.96645924	0.14940938	0.010447087
Japan	4.43893E+12	5.80318529	0.220448769	0.01379378
France	1.52647E+12	9.957196375	0.123328784	0.018859041
Russian Federation	9.60171E+11	27.22433883	0.158350863	0.027814522
United Kingdom	1.80105E+12	-2.401805257	0.019660867	0.197978839
Canada	9.35455E+11	6.096565103	0.015240022	0.22037
Saudi Arabia	2.9503E+11	-3.908310915	0.002944882	0.300089449
South Africa	2.09313E+11	-3.395085631	-0.017677037	0.518234889
United States	1.06947E+13	-1.839854473	-0.027061777	0.82188622

Concluding Remarks

- The attempt to prove FDI as a driving force of both GDP and Official Exchange Rate has been successful for most the G20 countries.
- If we consider both of the multinomial linear regression tables and sort adjusted R squared column in descending order and P value of F statistics column in ascending order, we can make a notion about the countries.
- Coefficients and intercepts of both the models may be positive or negative, but its robustness and statistical significance of robustness are actually important to

benchmark a country of G20 category about its adherence to the models. For FDI on GDP model. The present study analysis the policy related variables like openness of the economy, foreign exchange reserves, debt service ratio, strength of legal rights, tax policies and economic determinant, that is, GDP to throw light at the possible variables influencing the foreign direct investment inflows in India. The analysis shows that independent variables including GDP, Openness and LR affect the inflows of FDI to India. Among the major reasons which discourage the international investors from investing in India despite of its consistent economic growth includes: 1) Politics and corruption 2) Lack of infrastructure 3) Inadequate Legal system 4) Instability of Indian Social and

Table 9. The most adhered country to least country

	Intercept	FDI	Adj.R.Squared	P-value Fstatistics
Mexico	2.349526751	-4.44E-10	0.622598658	3.98E-09
India	36.21283806	-8.22E-10	0.694949617	2.20E-08
United States	1	-3.12E-28	0.487723475	9.28E-07
Turkey	0.426279281	-1.22E-10	0.37804486	3.08E-05
Brazil	0.78686726	-2.77E-11	0.375943926	3.27E-05
Indonesia	4818.860389	-4.30E-07	0.299101795	0.000273973
Australia	1.459500834	6.14E-12	0.297993498	0.001069672
Germany	2.213722851	-1.51E-11	0.253404592	0.022828376
Japan	117.4932871	-1.24E-10	0.164628518	0.031149857
China	5.679841183	-1.03E-11	0.086816741	0.042727253
Argentina	1.6495165	-3.89E-10	0.083173684	0.046352255
Russian Federation	30.62284863	4.98E-10	0.087178089	0.092796198
Korea, Rep.	961.3427554	5.78E-09	0.043982628	0.112114098
Italy	1437.473922	2.67E-08	0.096474027	0.120607702
France	6.641040308	-6.30E-11	0.089734423	0.129249956
United Kingdom	0.632591946	-2.04E-13	0.029022506	0.158514991
Canada	1.260108693	1.02E-12	-0.014517659	0.490835346
Saudi Arabia	3.724115032	3.20E-13	-0.026672036	0.800626624
South Africa	6.596369926	-2.49E-11	-0.030570895	0.885453752

Political environment 5) Absence of Corporate governance practices 5) Maturity of the financial markets All in all a more open policy frame is required which can be integrated with developing economies policy frame so that India becomes the most attractive destination and actually receive Foreign Direct Investment in the sectors which has potential to grow from foreign capital. Furthermore the integration at National level is required. As sectors which are covered under automatic route are subject to other caveats imposed by State and respective Ministry.

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