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AN EMPIRICAL INVESTIGATION OF THE EFFECTS OF BRAIN DRAIN ON ECONOMIC GROWTH IN PAKISTAN, WITH THEORETICAL CONTEXT OF LABOUR LAWS

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Abstract
This research work exploring the aspects which are responsible for Pakistan's brain drain. From 1997 to 2022, I looked at annual data for my research. The study employed different statistical methods like looking at simple summaries of the data, checking for multi-collinearity through the VIF, running serial correlation tests, Breusch-Pagan-Godfrey test, The OLS method to come up with the results that indicate Migration and remittances both help Pakistan's GDP increase in a good and noticeable way. On the other hand, the terrorism, inflation as well as unemployment have a bad effect on the Pakistan's GDP. In addition, GFCF does not bring any change to Pakistan's economy. The current study suggests that since people in Pakistan don't have many chances to move up their careers, a large number of them have decided to leave the country for better opportunities. Additionally, our economy doesn't have enough jobs for all the skilled workers and government should pay attention to make laws in favor to stop the brain drain.
Keywords: *GDP, Migration, Remittances, Terrorism, Inflation, Unemployment, Pakistan.*

INTRODUCTION

The term "brain drain" refers to how well-skilled people decide to move from one country to another for better work opportunities, better income, or improved working conditions. Over the years, Pakistan has seen many skillful and educated people move to other countries to take advantage of what they offer.

The brain drain in Pakistan happens for several reasons, including better job opportunities outside the country, safer living conditions, and a reduced cost of living in other places. The scarcity of jobs available and low pay is both big reasons why people can't afford enough food. Finding a job that matches what they learned in school and what they are good at can be hard for a lot of people who have a lot of education and skills. So, a lot of people look for work abroad where they may make more money and work in a better setting. Terrorism has had a huge impact on Pakistan's brain drain. For many years, the country has been afflicted by terrorist operations, which has resulted in a fall in economic growth, insecurity, and instability. Terrorism has had a significant influence on Pakistan' brain drain by introducing fear as well as nervousness among the population. Because many feel their safety is threatened, their quality of life has gone down. Because of this, many able and well-educated people have left the country to try to ensure a safer future for themselves as well as their

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families. Mainly doctors are becoming part brain drain due to some push and pull factors (Tahir, 2011; and Azizullah, 2024). High pay of the doctors is anothers cause of brain drain from Pakistan (Imran,2011; and Meo 2023)

Pakistan sees a large influence of inflation on its brain drain. People lose purchasing power as good and services increase in price due to inflation. When inflation is high, people start to feel safer working abroad, thus brain drain can occur. Inflation leads to a reduction in the standard of living for people in Pakistan. If the prices go up, people have a tougher time living as they did earlier and their money does not buy them as many things. People can get so discouraged by this that they choose to find better ways elsewhere. Besides, when prices rise, it encourages slower economic growth. With a high inflation rate, companies struggle to do business and find it challenging to bring in foreign investment. If there are not enough economic chances, skilled and educated people may migrate to different countries for a better income and employment opportunities.

Remittances describe the funds that are sent by migrant workers to their families back at home. In countries such as Pakistan, remittances play a key role in their financial income. Yet, the flow of remittances may influence the issue of brain drain in Pakistan. Besides, remittances can positively affect the Pakistan' economy. When people are sent remittances, they can spend the money, which helps the economy grow and creates additional job opportunities. This step can deal with the main factors that cause brain drain, such as not enough work opportunities and low payments. All in all, brain drain is a serious problem in Pakistan because important people with training and knowledge leave and might have contributed to the motherland's development. In short an over-populated country like Pakistan is facing unplanned brain-drain Farooq (2017).

Majority of the people who were participant have thought that job dissatisfaction,
and poor economic returns for manpower as a push factor for their move to any country (sajjad, 2011; Munawar 2020)

LITRATURE REVIEW

Malokani et al., (2022) argued that business technology makes it easier for countries to achieve their sustainable development goals. Effective policies should be created to encourage nations to invest in technology. Employing firms with modern technologies won't require qualified workers to travel abroad. As the nation's trained labour grows, renewable energy initiatives will have the opportunity to grow even further. However, these experienced people will also be able to develop creative ideas for enhancing efficient use of energy. These situations will help we bring about sustainable solutions by looking at ways to keep people here who have important skills, and also see how we can get emerging economies to grow in a way that lasts. First, the main features of the balanced scorecard are used to find out what goals and measures are needed. These features are checked using things like the golden ratio as well as the BOFQ M-SWARA technique. Second, the study looks at how BOFQ ELECTRE did compared to the golden ratio when it came to helping cut down on brain drains in seven emerging economies. An assessment is also done using IFSs and PFSs to check if the results are correct. The outcomes end up the same no matter which fuzzy set is used. This situation shows that the results match up well and can be trusted. Technical competence is seen as the main reason why doctors and nurses decide to stay in a country and not leave for a better job abroad. While majority of the migrants are low-skilled workers and unawer to labour laws (Shah, 2020).

Shabnum, Iqbal, and Khan (2021) discover that brain drain is one significant problem in exploring both development economics and demographic transitions. A country with a large population can export its human resources. Many factors can impact the way human capital (HCO) moves. Some are inspired by reasons such as the economy, society, and politics. This

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study compares the effects of different variables on the HCO. Also, it recommends how to control HCO according to its findings. Researchers use questionnaires to gather information from three areas in Peshawar, both urban ones and rural ones. The sampling method is random. The significance of different aspects can be observed by Probit models. It is clear from the research that both unknown religious and environmental elements have a strong influence on HCO, too, apart from the usual economic, social, and political factors. Further investigating factors that influence the HCO will give future researchers more ideas for their studies. They perform research in a variety of ways and in different subjects. Knowing which aspects of brain drain matter more and less helps to form economic policies. Results from this study suggest that the most important aspects are generating work, paying a worthy salary, and maintaining a cheaper way of living. The findings reveal that the local currency is stable, inflation is controlled, public health is improved, people are treated equally, free education is available from primary to high school, the government looks after its dependents, the environment is conducive to growth, there is political stability, ample security, respect for the law, freedom to say what one thinks, and solutions for minorities.

The research work examined how diaspora commitment may be utilised to convert Pakistan' brain outflow hooked on brain gain, according to Surani (2021). Interviewing diaspora members was crucial in determining how emerging nations, like Pakistan, may apply their knowledge for their own development. For the aim of this study, an entire set of personal conversations with Pakistani immigrants who have settled in the Greater Toronto Area were displayed. The study's conclusions show that Pakistan has a good opportunity to involve the more than seven million people living abroad to help train, support, and build the country's skills and resources. The study found that how long someone has been in a new place and what life stage they are in can affect how much knowledge they pass on to others about their part of the world. People who are new to a country are less likely to tell others things about their background than people who have been there for a while. Mutual trust, sticking to clear rules about how diaspora members get involved, and making sure that all sending countries' different views are heard were all seen as important for making the plan work. Pakistan has a chance and a need to think again about how it looks at the people who live outside its borders and the parts they could play in helping the country as a whole.

Ahmad et al., use information from 1990 to 2018 to look at what affects Pakistan's brain drain problem. The study looks at different measures to see if anything might cause people from Pakistan to move to other richer countries. The WDI as well as the Bureau of Emigration and Overseas Employment (BEOE) have given us some extra information to use. The study claims that, infrastructure, financial positions, living standard, as well as governments all play a significant, long-term, and negative role in leading to brain drain. Over time, social openness doesn't slow down brain drain. Considering the study's conclusions, brain drain in poorer states is a big problem which requirements to be dealt with more urgently. The process gives authorities a better understanding of why experts leave the sector and this knowledge guides the formulation of regulations to counter this issue.

METHODOLOGY

Most of the data from the World Bank formed the basis for gathering the information for the dependent and independent variables in this model. This analysis covers a period of 26 years from 1997 to 2022. Barnes and Dhillon applied OLS regression analysis using the methodology approach.

Econometric Model:

$$GDP = \beta_0 + \beta_1 MIG_t + \beta_2 REM_t + \beta_3 TER_t + \beta_4 GFCF_t + \beta_5 INF_t + \beta_6 UN_t + \varepsilon_t$$

Here,

GDP = Gross Domestic Product

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MIG = Net Migration
REM = Remittances
TER = Terrorism
GFCF = Gross Fixed Capital Formation
INF = Inflation
UN= Unemployment
ε = Error term

Results

This section explains how the data from the Asian countries was analyzed through conducting econometrics tests.

Table 1: Descriptive statistics

	GDP	MIG	REM	TER	GFCF	INF	UN
Mean.	3.96280	-8.1888	4.73665	1.13774	14.8761	7.3839	1.99632
Median.	4.26008	-6.7822	4.44778	0.605	14.6228	8.69215	1.65
Maximum.	7.5468	8.4073	8.99091	3.924	17.7319	21.2861	7.56
Minimum.	-1.2740	-21.904	1.31069	0.051	12.5206	3.52932	0.40
Std.Dev.	1.955	9.22125	2.14339	1.17492	1.52393	5.67499	2.97590
Skewness.	-0.5117	-0.2807	0.13024	1.0594	0.39287	0.97062	1.02422
Kurtosis.	3.29304	2.4732	2.15805	2.82811	2.09727	3.67890	2.67608
Jarque—Bera	1.27493	0.66683	0.87381	5.08399	1.61136	4.75801	4.83872
Probability.	0.52862	0.71647	0.64603	0.07870	0.44678	0.09264	0.08897
Sum.	106.995	-194.11	127.889	30.7191	401.655	225.366	52.900
Sum Sq. Dev.	99.4234	1757.31	119.447	35.8915	60.381	568.245	101.5092
Observations.	27	27	27	27	27	27	27

GDP, MIG, REM, TER, GFCF, INF and UN have an average of 3.96280, -7.1888, 4.73665, 1.13774, 14.8761, 8.3839 and 1.99632, respectively. According to the data, the maximum value of GDP is 7.5468, of MIG is 9.4073, of REM is 8.99091, of TER is 3.924, of GFCF is 17.7319, of INF is 20.2861 while the minimum' value is for UN, which stands at 6.55. GDP reached minimum value at -1.27409, MIG minimum was -22.9041, while REM reached minimum value at 1.310692, similarly TER, GFCF, INF and UN have 0.051, 12.542063, 2.529328, and 0.4 respectively.

Variance Inflation Factor

Table 2:

	Centered
Variable	**VIF**
MIG	4.011237
REM	7.610055
TER	3.096071
GFCF	3.168342

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INF	3.487847
UN	6.14152

As another method, VIF are also important for checking if there is multicollinearity, with many experts suggesting that the VIF value should be no more than 10, so table show that there is no multicollinearity.

Table 3: Heteroskedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-stat	1.761011	**P. F (7,18)**	0.1574
Obs*R-squared	10.56824	**P. Chi-Square (7)**	0.1586

Since the pv is larger than 5%, there is not hetero-skedasticity. I found that the F-stat is equal to 1.761011. Based on the test, the P-value of is 0.1574, which is bigger than 0.05.

Table 4: Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.996942	**Prob. F (2,16)**	0.1682
Obs*R-squared	5.193638	**Prob. Chi-Square (2)**	0.0744

Since the p-value is bigger than 5%, there is no auto-correlation present in the data.

Ordinary Least Square (OLS)

Table 5: Ordinary Least Square (OLS)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
MIG	0.104962	0.020036	5.23863	0.0001
REM	0.517628	0.22982	6.603605	0.000
TER	-0.09717	0.205106	-0.47373	0.0414
GFCF	0.457047	0.38141	1.198311	0.0663
INF	-0.35955	0.065143	-5.51931	0.000
UN	-0.933	0.217803	-4.2837	0.0004
R-squared	0.794518			
Adjusted R--squared	0.636827			
S.E.. of regression	1.49146			
Prob (F-statistic)	0.010867	Durbin--Watson stat		2.128643
Prob (Wald F statistic)	0			

The summary table shows that the Ordinary least square method gives MIG a coefficient of 0.104962 and a probability value of 0.0001. This means that for every unit rise in net migration, the GDP will increase by 0.104962 units. Net migration is strongly and positively linked with the GDP of a nation. Since the coefficient-value of REM is 0.517628 as well as the p value is less than 5%, it predicts that a 1% variation in REM will lead to a 0.517628% alteration in GDP. Remittances play a meaningful and good role in boosting a nation's GDP. It will be possible for GDP to decrease by 0.09717 when TER rises by 1 unit, given the coefficient value and probability value. Terrorist activities harm the GDP of countries. It is clear that GFCF does not strongly affect GDP in a reliable or noticeable way based on its

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CJSSR
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0.45047 coefficient in GFCF and 0.0663 probability value. This means that a 1-percent rise in inflation decreases GDP by -0.35955 percent. There is a major and negative effect of inflation on a country's GDP. It means that a one-unit rise in unemployment would be related to a decline in GDP by -0.933 units with a high probability of 0.0004. Unemployment has a strong and detrimental effect on the GDP.

Conclusion

The purpose of the study is to explore the variables leading to brain drain in the Pakistan. The research used time series data each year from 1997 to 2022. In this study, we review a number of relevant academic works. It looks into the factors leading to brain drain in several countries, applied earlier research.

After that, the study applied different econometric techniques. At the beginning, the study summarizes the results from descriptive statistics. Mean, median, maximum, minimum, skewness, as well as kurtosis can be found in a subset of statistical descriptions known as descriptive statistics. Second, the study looks at the correlation data for individual pairs of variables to check for any signs of multicollinearity. Analysis reveals that there is no multicollinearity among the data.

Then, the study applied the Serial Correlation LM Test to evaluate the Autocorrelation problem. No autocorrelation is present in the data. Next, research investigates the problem of heteroscedasticity. According to test findings, the data has no autocorrelation.

In the next phase, the Breusch-Pagan-Godfrey Test is applied to find out whether the data is heteroskedastic. Heteroscedasticity is not present in the data set, as shown by the Breusch-Pagan-Godfrey test.

From the OLS analysis, it is clear that MIG and REM cause positive as well as significant growth in Pakistan' s Gross Domestic Product. On the other hand, the TER, INF as well as UN bring negative effects on Pakistan's economy. In addition, GFCF does not have a direct impact on Pakistan's economy. According to the report, there are few career opportunities for improvement in Pakistan, which has led to a main rise in people leaving the country in the previous few years. The current level of our economic growth does not allow for a large influx of skilled workers entering the workforce each year.

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CJSSR
CONTEMPORARY JOURNAL OF SOCIAL SCIENCE REVIEW
Vol.03 No.02 (2025)

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