

The inter-relationship between foreign direct investments and unemployment: case study of China, India and Singapore

Florida Veljanoska

Higher College of Technology,
St # 19, Muroor Road, Al Saada Street,
Al Nahyan – Abu Dhabi, UAE
Email: fveljanoska@hct.ac.ae

Abstract: This paper will empirically test the causality between FDI and unemployment. Hence, the main purpose of this empirical research is to test the hypothesis that the FDI inflows are directed towards the countries with high unemployment rate, and that FDI inflows lead to the reduction of the unemployment rate in the receipt country. The analysis will be done for China, India and Singapore, which are constantly ranked as the most attractive destinations for FDI inflows. The analysis covers the period 1991–2018. The Granger causality test was conducted in order to discover the causal relationship between the FDI inflows and unemployment. The results from the test have shown that in all three countries there is one-directional causality, and that unemployment Granger cause FDI, while FDI does not have significant influence on unemployment rate.

Keywords: FDI; unemployment; EViews 9; Granger causality test; GCT; labour costs; unit root test; China; India; Singapore.

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Biographical notes: Florida Veljanoska holds a PhD in Economic Sciences – Financial Management. She has ten years of teaching experience. Currently she works at Higher Colleges of Technology. She has published more than 50 scientific papers in internationally recognised scientific journals, including the ones that are index by Scopus, Web of Science, Global Impact Factor, Index Copernicus, etc. Also, she has experience in international relations, and developing collaboration between universities. Her research broadly concerns foreign direct investments, foreign loans, domestic and international investments, etc. Also, she is a regular speaker at academic and practitioner conferences at both national and international level. She is also an author of a book chapter and a university book.

1 Introduction

Unemployment is one of the most serious problems that face many developing countries. High rate of unemployment not only that is a signal of poor living standard, but is a

serious threat for macroeconomic stability of the country. In order to solve this problem, many policy holders introduce different measures with the aim to reduce the unemployment rate. Among the measures which are used with the aim to reduce the unemployment rate, is the attraction of FDI inflows. Namely, many experts believe that FDI inflows can have positive impact and can reduce the unemployment rate in a very short period of time.

The relation between FDI and unemployment is not unidirectional. Specifically, in the theory there are many authors who argue that the FDI directions are towards the countries with higher level of unemployment, because high unemployment in the same time means low labour costs. That is, if unemployment rate in the country is high, it shows that the number of people who are looking for jobs exceeds the current available jobs, or simply the supply of labour is greater than the demand for it. As a consequence, the employers are reluctant to 'bit' and pay higher wages. On the other hand, if the unemployment rate is low, it means that the demand for labour exceeds the supply of it, and consequently the employers need to pay higher wages in order to attract employees, which ultimately leads to higher labour cost.

All authors agree that multinational companies (MNC) try to reduce the overall expenses and are investing in countries with cheap natural resources, cheap labour, low taxes, etc. Therefore, the MNCs invest in countries with low labour costs. However, here we must note that a high unemployment can be a sign of macroeconomic disequilibrium, and if the level of unemployment is extremely high and the macroeconomic stability is endangered, the MNC will refrain from investing in countries with an extremely high level of unemployment.

From the abovementioned, we can conclude that the inter-relationship between the FDI and the unemployment can be in both directions. Namely, according to many scholars FDI reduces the unemployment rate, and on the other hand, a higher rate of unemployment and accordingly low labour costs, are the factor that attracts FDI.

Although this causal relationship between the FDI and unemployment is elaborated in the theory, the empirical results are very limited. That is actually the reason why in this paper empirically will be examined the inter-relationship between the FDI and the unemployment. Hence, the main objective of this research is to empirically test the hypothesis that the higher inflows of FDI lead to reduction of unemployment rate, and vice-versa, higher unemployment rate attracts the foreign investors. These hypothesis will be tested for each of the analysed countries, separately.

In order to study the causal relationship between the FDI and the unemployment, we have analysed the data for three countries – China, India and Singapore, which are consistently ranked as the most attractive destinations for FDI inflows. We must note that the countries that are included in the analysis were carefully chosen, in order not to analyse the countries with an extremely high level of unemployment. Hence, these countries didn't suffer from an extremely high unemployment rates and consequently foreign investors didn't face the risk of possible macroeconomic instability, caused by extremely high unemployment rate. Thus, the analysis will give us a clear picture whether unemployment is a factor that determines the FDI flows.

The empirical analysis is done with the help of econometric software EViews 9.0. The research covers the period 1991–2018. In order to get the most credible results, we have used the data provided by the World Bank Database (WB), as well as from the national data providers in respective countries: Singapore Department of Statistics, National Statistic in India and National Bureau of Statistic in China. Empirical analysis in

this paper is based on Granger causality test (GCT), which determines whether there is causality between the two variables, or more precisely to determine whether the historical data of FDI inflows can be used for predicting the future values of unemployment, and vice versa, whether the historical values of unemployment can be used for predicting the future values of FDI inflows. Since the GCT, requires stationary series, using the augmented Dickey-Fuller (ADF) unit root test, we have tested the stationarity of the unemployment and FDI inflows series.

The paper is organised in four sections. The first section is dedicated to the literature review, then in second section, the details about the relation between the unemployment and the labour costs is elaborated, as well as the tax burden and contracts for analysed countries are presented. In the third section the data about the unemployment and FDI in China, India and Singapore, are presented. In the fourth section the methodology and empirical results from the research are elaborated. The paper finishes with the final conclusions, where the results of the study are summarised.

2 Literature review

The inter-relationship between the unemployment rate and the FDI inflows is still one of the main areas of interest that attracts considerable attention of many scholars. There are many researchers that work on this topic, but the findings of the analysis are different. There are some authors who found positive inter-relations between FDI inflows and unemployment, some found uni-directional relationship, and some did not find any relationship. In this section, we will try to elaborate the most important researches related to this topic.

Positive relationship between FDI and unemployment was confirmed by Bakkaçlı and Argin (2013), who proved in their study that there is a positive impact of FDI inflows on unemployment in Turkey in the period 2001–2011. Similar results have been found with the study conducted by Karlsson (2009), who reported a positive relationship between FDI and unemployment rate in China, in the period 1998–2004. Broader approach in analysis was used by Irpan et al. (2016), who explored the relationship between the FDI and the unemployment, including in their study other variables, such as GDP, number of foreign workers and exchange rate. They confirmed that FDI, number of foreign workers, and GDP had significant influence on the unemployment rate in Malaysia. Similar results related to the inter-relationship between the FDI and unemployment found Palát (2011), who explored the relation between FDI inflows and unemployment in Japanese economy. His research has approved the correlation between the FDI inflows in Japan and Japanese rate of unemployment.

Bayar (2014) has examined the inter-relationship between the unemployment, economic growth, export and FDI in Turkey in the period of 2000–2013, and found long run relationship between unemployment, economic growth, export, and FDI inflows. He also argued that there is a negative relationship between unemployment and economic growth, export, while positive relationship between unemployment and FDI inflows. In another study that focused on 21 emerging economies in the period 1994–2014, Bayar and Sasmaz (2017) using the co-integration analysis found co-integration relationship between domestic investments, foreign direct investments, and unemployment. In his study he also confirmed that FDI inflows affected the unemployment positively in the long term, but domestic investments affected the unemployment negatively. Balcerzak

and Źurek (2011) using the VAR analysis for the period 1995–2009 proved interdependence between FDI and employment in Poland. The proof that FDI inflows can have significant impact on unemployment is one study conducted by Zeb et al. (2014), as well. Namely, Zeb et al. revealed that FDI played a great role in unemployment reduction in Pakistan.

Despite the previously mentioned studies, which confirmed the positive relationship between the FDI and the unemployment rate, there are some researches that found no causal relationship between the analysed variables. These studies suggest that too high unemployment rate recorded in a country is perceived by foreign investors as a signal of macroeconomic disequilibrium and therefore the country is not seen as an appropriate host country for future investment (Brozen, 1958). Similar results were found by Grahovac and Softic (2017), who conducted a research on six Western Balkan countries – Bosnia and Herzegovina, Macedonia, Croatia, Serbia, Albania, and Montenegro, and found no impact of FDI on unemployment and vice versa, in all five countries, except in Croatia. Aktar and Öztürk (2009) also found no causal relationships between the unemployment and the FDI in Turkish economy. The same conclusion for the Turkish economy was reported by Saray (2011) for the period 1970–2009.

Simonescu and Simonescu (2017) explored the connection between the FDI and the unemployment rate in USA using the vector error correction method and found that only long-run changes in the USA unemployment rate have influence on FDI inflows. They did not confirm any short-run relationship between FDI inflows and variation in unemployment rate.

3 Labour costs, tax burden and contracts

As it was previously mentioned, high unemployment rate is related to low labour costs, since the employers are reluctant to ‘bit’ and pay higher wages in the situation when supply of workforce is sharply higher than the demand for it. On the other hand, if the unemployment rate is lower, it supposes to lead to higher wages, since employers are forced to attract employees, by offering them better conditions, including higher wages, which ultimately leads to higher labour cost. This is especially truth for labour-intensive foreign investments, where the savings on labour costs, lead to big overall savings for the companies.

However, we need to emphasise that for the company the cost is the gross salary, which means net salary plus all other taxes and contributions paid by the employer. Hence, even if the net salaries are low, but the tax burden and salary contributions are high, the overall labour costs for the company may be too high, and even though the country has high unemployment and low net wages, the total labour costs may be high for the companies. Similar impact on labour costs may have the contracts and labour unions. In the countries where the labour unions are strong and influential or/and have labour laws that provide high workers protections, the unemployment may not lead to higher FDI, since MNCs are reluctant to invest in countries where there is too much protection for workers, and where labour unions have high negotiation power and can have a great impact on salaries, working hours, annual leave, etc.

In order to get a clear picture about the impact of abovementioned factors in China, India and Singapore and their impact on labour cost and position of the workers in the

country, we have analysed the tax burden and the laws and labour unions in the respective countries.

In 2010 in China the average and marginal tax wedges are almost same in size as many OECD countries. Since China's economic slowdown started in the mid-2010s, very limited legislative was introduced with the aim to bolster workers' rights and senior government officials have openly discussed rolling back some existing protections in a bid to create a more pro-business legal environment. This is a proof that the main objective is to create favourable investment climate for foreign investors, which sometimes can even lead to workers' rights reduction.

As for the tax burden, with the new 'special individual income deductions', many new changes were introduced for low and middle income earners, taking a tougher stance on high-earners and foreign workers. The individual income tax ranges from 3% for the salaries which are less than \$240, and 45% for salaries over \$12,725. Obviously, this is another measure that will stimulate hiring of low income employees and attracting more labour-intensive investments that will exploit the advantage of low labour costs.

As for labour unions, in China exists 'All China Federation of Trade Unions' (ACFTU). Many experts argue that ACFTU failed to act as a genuine trade union organisation, but instead of putting workers' interests and the protection of their rights first, the ACFTU, has often prioritised the interests of business over those of labour. As a consequence ACFTU faces a crisis of legitimacy in the eyes of many workers, who increasingly turn to alternative methods of struggle outside of the officially sanctioned union. Hence, the activities of ACFTU favour the interests of investors, and create climate for exploiting the opportunities of low labour costs.

Similar to China is the situation in India. The country is also committed to creating favourable investment climate, sometimes even to detriment of the workers. Namely, due to the COVID 19 situation, the government in India introduced some amendments to the Labour law that reduced the workers' rights, and are considered as anti-workers amendments by the trade unions. As for the tax burden, India has progressive taxation with many exemptions and deductions. The taxes range from 5% to 30%. According to the OECD, India has very low average and marginal wedges compared to the OECD countries. The tax to GDP ratio in India is very low. As for the trade unions, although there are large numbers of trade union, their role in improving workers' rights is disputable. There is a problem that those unions are divided along political lines, which further reduces the chances for real improvement of the workers' position in the society. The fact that there are 92.4% informal workers in India without written contract, paid leave and other benefits in the economy, speaks much about the real situation of the workers in India.

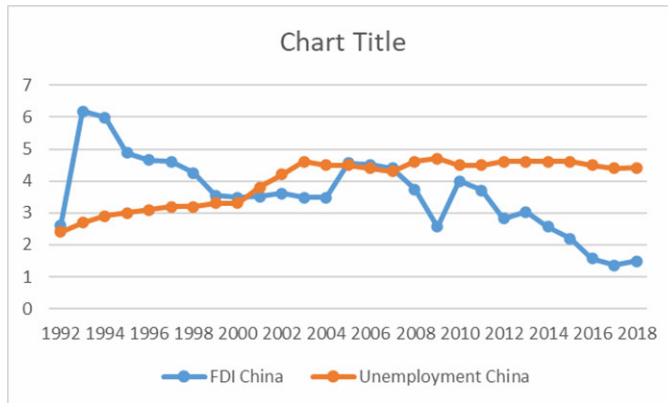
The situation in Singapore is quite different than the one in China and India. The basic terms and working conditions are determined by the Employment Act, and the workers' rights are improved over time. National Trades Union Congress forms the majority of labour movement in Singapore. The labour tax burden in Singapore is not very high. Namely, there is a flat 15% tax or progressive taxation, whichever results in higher tax amount.

At the end of this part we can say that the tax burden, as well as the overall workers' policy run by the governments in the analysed countries, especially in China and India is in favour of foreign investors, and creates favourable climate, which further attracts the MNCs.

4 FDI and unemployment in China, India and Singapore

Before the presentation of the methodology and the empirical results from the analysis, the data about the FDI and the unemployment rate in China, India, and Singapore will be presented. In Figure 1 are presented the data about China.

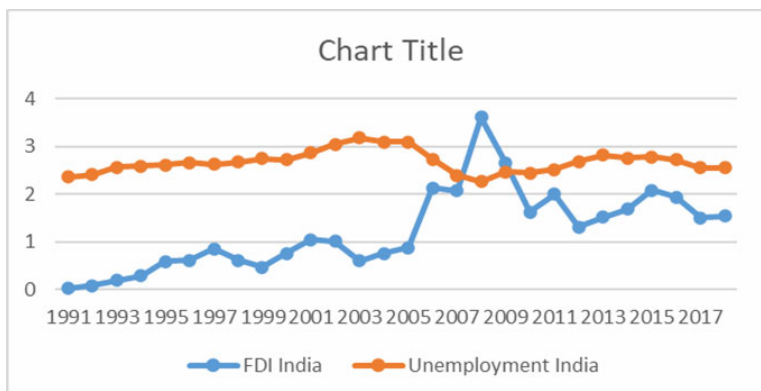
Figure 1 FDI (as a percentage of GDP) and unemployment in China in the period 1991–2018 (see online version for colours)



Source: WB database

Figure 1 suggests that the unemployment rate in China has a slight upward trend, without sharp changes. As for the FDI inflows, it is noticeable that the FDI inflows as a % of GDP have fallen, and that the downward trend of FDI is far more obvious than the increase in the unemployment rate. What worth mentioning here is that the FDI inflows and the unemployment rate moved in the opposite direction. Namely, as the FDI inflows decrease, the unemployment rate increased. This is an indicator of a possible interdependence between the two phenomena.

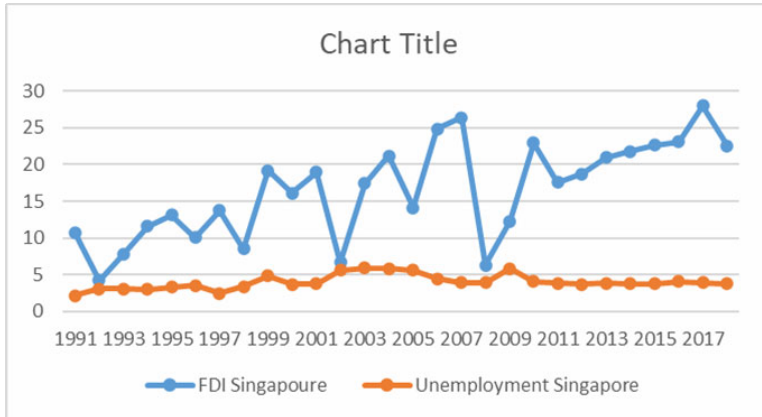
Figure 2 FDI (as a % of GDP) and unemployment in India in the period 1991–2018 (see online version for colours)



Source: WB database

As Figure 2 suggests, the unemployment rate in India was relatively stable in the analysed period. On the other hand, the FDI inflows generally had an upward trend until 2009, when reached a peak of 4.7% of GDP. In the years after, the FDI inflows sharply decreased to 1.3% in 2017. Noteworthy, that in the period 2007–2009, when India had the highest value of FDI inflows, it also had the lowest rate of unemployment – only 2.2%. This fact is an indicator of the possible interdependency between the FDI and the unemployment in India.

Figure 3 FDI (as a % of GDP) and unemployment in Singapore in the period 1991–2018 (see online version for colours)



Source: WB database

As for the case of Singapore, the FDI inflows were very unstable in the period 1991–2018. Namely, the data suggests that the FDI inflows were changing sharply in a relatively short period of time. For example, they were almost 11% of GDP in 1991, then down to 4% in 1992, and then again above 7% in 1993. Similarly, in 2001 were nearly 19%, then down to only 6.6% in 2002, and then strong growth to 17.5% in 2003 and above 21% in 2004. The unstable trend of FDI in Singapore was especially evident during the global crisis, when from the record level of 26% of GDI, FDI inflow dropped sharply to only 6%. In the last couple of years the FDI inflow trend in Singapore is generally upward, except in the last years, when it dropped from the historically highest level of above 28% to 22% of GDP. What refers to the unemployment rate, it is obvious that the unemployment rate in Singapore has a far more stable trend than the FDI inflows, and it ranges between 3.18% in 1991 and 5.86% in 2009.

5 Methodology and results

As we have already mentioned the data for this research were provided from the WB database, as well as from the national statistics institutions in respective countries: Singapore Department of Statistics, National Statistic in India and National Bureau of Statistic in China.

The data refers to the unemployment rates and FDI inflows in analysed countries – China, India and Singapore. The annual data are for the period from 1991 to 2018. Empirical analysis is based on GCT, with the aim to show whether the historical data of FDI inflows can be used for predicting the future values of unemployment, and vice versa, whether the previous values of unemployment can be used for predicting the future FDI inflows in China, India and Singapore.

However, we already mentioned that GCT has some requirements in order to be eligible for use. Namely, the analysed variable series must be stationary in order to be suitable for GCT analysis. It follows that we must first test whether the variables are stationary. The stationarity of the variables is tested using the unit root test. For that purpose we will use the ADF test.

5.1 ADF unit root test

ADF test was used in order to test whether the series for FDI inflows and unemployment rates in China, India and Singapore are/are not stationary – have/does not have unit root. As we have previously mentioned, the EViews 9.0 computer software was used with the purpose to conduct the ADF test. Stationarity of the variables can be determined on level form, on first difference, or on second difference. We need the variables to be stationary on its' level form or on its' first difference. The unit root test was performed for both series – FDI series, as well as for the unemployment series.

As explained before, in order to be able to continue with our research – with GCT, we need to be able to reject the null hypotheses that there is a unit root, either on level form or on first difference. We would like to emphasise that when we analysed the test results, we have used a critical value of 5% level of significance. In addition, are given the results from the unit root test.

Table 1 ADF unit root test for FDI inflows and unemployment in China, India and Singapore

| | | |
|---|-------------------------------|---|
| 1 | FDI inflows – China | Reject null hypothesis – first difference |
| 2 | Unemployment rate – China | Reject null hypothesis – first difference |
| 3 | FDI inflows – India | Reject null hypothesis – first difference |
| 4 | Unemployment rate – India | Reject null hypothesis – level |
| 5 | FDI inflow – Singapore | Reject null hypothesis – level |
| 6 | Unemployment rate – Singapore | Reject null hypothesis – level |

Source: Research calculations

The results of the ADF test showed that for all analysed series (FDI inflows and unemployment rate) we can reject the null hypothesis, and accept the alternate hypothesis, either on level form or on first difference. The above given results are in accordance with the requirements of the GCT, which enables us to continue with the research analysis in this paper, and further examine the inter-relationship between the FDI inflows and the unemployment rate in China, India and Singapore.

5.2 *Granger causality test*

The purpose of this paper is to confirm the hypothesis that FDI inflows are directed towards the countries with high unemployment rate, and that FDI inflows lead to reduction of the unemployment rate. In order to test the hypothesis the causal-interrelationship between the FDI inflows and the unemployment rate was analysed. The most suitable empirical method for testing this inter-relationship in econometrics is GCT. This test is especially useful for the policymakers, because it enables them to predict how one variable will move, once the other variable is changed. Hence, they are able in advance to project the possible effects of their measures. Follows that GCT helps the governments to promote measures and have high degree of confidence about the outcomes of the measures that are planning to take.

As we mentioned earlier, GCT shows the inter-relationship between two variables. Hence, GCT indicates whether one variable determines the movement of other variables (either positive or negative direction). Hence, it will show us whether unemployment rate and FDI inflows are inter-related between each other. The following are the hypothesis in our research:

| | | |
|-----------|-----|---|
| China | 1.1 | The null hypothesis: FDI inflows does not Granger cause unemployment rate. |
| | 1.2 | The alternate hypothesis: FDI inflow does Granger cause unemployment rate. |
| | 1.3 | The null hypothesis: unemployment rate does not Granger cause FDI inflows. |
| | 1.4 | The alternate hypothesis: unemployment rate does Granger cause FDI inflows. |
| India | 2.1 | The null hypothesis: FDI inflows does not Granger cause unemployment rate. |
| | 2.2 | The alternate hypothesis: FDI inflow does Granger Cause unemployment rate. |
| | 2.3 | The null hypothesis: unemployment rate does not Granger cause FDI inflows. |
| | 2.4 | The alternate hypothesis: unemployment rate does Granger cause FDI inflows. |
| Singapore | 3.1 | The null hypothesis: FDI inflows does not Granger cause unemployment rate. |
| | 3.2 | The alternate hypothesis: FDI inflow does Granger Cause unemployment rate. |
| | 3.3 | The null hypothesis: unemployment rate does not Granger cause FDI inflows. |
| | 3.4 | The alternate hypothesis: unemployment rate does Granger cause FDI inflows. |

We must note that if we reject the null hypothesis, and consequently accept the alternative hypothesis, the causal inter-relationship between the variables is confirmed, and the opposite, if we accept the null hypothesis, we will confirm that the analysed variables does not influence on one another.

The results of GCT are very sensitive to lag lengths. Accurate determination of lag length is critical for accurate research results. There are many different lag selection criterions, such as Sequential modified LR test statistic, Final prediction error, Akaike information criterion (AIC), Schwarz information criterion and Hannan-Quinn information. According to many experts, the AIC and Schwarz's criterion are the most accurate criterions, and that is why we have determined the lag length using these two criterions. According to the results of both, the optimal lag length for all three countries – China, India and Singapore is 2.

Table 2 shows the results from GCT for all three countries.

Table 2 GCT results (2 lags)

| | <i>F</i> -statistic | <i>Prob.</i> | <i>Reject/accept</i> |
|---|---------------------|--------------|------------------------|
| UNEMPLOYMENT_CHINA does not Granger cause FDI_CHINA | 7.74516 | 0.0106 | Reject null hypothesis |
| FDI_CHINA does not Granger cause UNEMPLOYMENT_CHINA | 0.04155 | 0.8403 | Accept null hypothesis |
| UNEMPLOYMENT does not Granger cause FDI_INDIA | 6.76676 | 0.0050 | Reject null hypothesis |
| FDI_INDIA does not Granger cause UNEMPLOYMENT | 0.78033 | 0.4711 | Accept null hypothesis |
| UNEMPLOYMENT does not Granger cause FDI_SINGAPOURE | 7.15924 | 0.0132 | Reject null hypothesis |
| FDI_SINGAPOURE does not Granger cause UNEMPLOYMENT | 0.56441 | 0.4598 | Accept null hypothesis |

Source: Research calculation

The following were the inputs in the analysis:

- lag length – 2 for all countries
- 5% level of significance.

The interpretation of the research results are based on the comparison between the p-value calculated in the research and the accepted level of significance, which in our research is 5%. In order to accept the null hypothesis we need to have p value higher than 0.05, while if the p-value is lower than 0.05, we should accept the alternate hypothesis. From the research results we can conclude that the p value is lower than 0.05 when we analyse the impact of unemployment rate on FDI inflow in China, India and Singapore. The opposite is the case with the impact of FDI inflows on unemployment rate. The empirical research for all three counties showed that the p-value is higher than the acceptable 5% or 0.05, and therefore we can say that FDI inflows does not have any impact on unemployment rate. Accordingly, we can conclude that in all three countries the causal inter-relationship between the FDI flows and unemployment proved to be uni-directional – and goes from unemployment to FDI flows.

Again we emphasise that only by rejecting the null hypothesis and accepting the alternate hypothesis we can confirm that one variable can influence on the movement of the other. Hence, we can summarise the results from our research, once again:

- unemployment rate does Granger cause the FDI inflows – historical data of unemployment can be used as a base for predicting the future values of FDI inflows
- FDI inflows does not Granger cause unemployment rate – historical data of FDI inflows can't be used as a base for predicting the future values of unemployment rate.

6 Conclusions

High unemployment rate can be a serious problem that may have far-reaching negative consequences on macroeconomic stability of a country and on the overall economy. Countries introduce many measures in order to reduce the unemployment rate including promoting measures to attract FDI inflows. Many scholars argue that FDI inflows are among the most effective ways for reducing unemployment rate in short and long term. That especially refers to the Greenfields investments. Although theory confirms these statements, the empirical results are still not clear.

In order to examine the impact of FDI inflows on unemployment reduction, the data of China, India, and Singapore, the countries that are considered as one of the most attractive FDI destinations, were analysed. The analysis included the period 1991–2019. The GCT was conducted and it showed that FDI inflows does not Granger cause unemployment rate. Hence, the results suggest that in the case of China, India, and Singapore, FDI inflows did not influence on unemployment rate, and that the historical data of FDI inflows cannot be used as a basis for predicting the future values of unemployment.

Despite exploring the impact of FDI inflows on unemployment rate, the objective of this paper was to determine the impact of unemployment rate on FDI inflows, as well. Namely, it is widely accepted that MNCs are looking for cheap resources, such as natural resources, labour costs, low taxes, etc., in order to decrease overall costs and to increase the profitability. Labour costs can have a significant share in the overall company's expenses, and therefore the savings in labour cost can have a substantial effect on MNC's savings. Considering the law of demand and supply, it is normal that high unemployment shows that there is abundant of supply and low demand of work force, which in turn lead to low labour cost. Hence, it is to expect that higher unemployment rate (not extremely high that is a sign of macroeconomic disequilibrium) supposes to be a factor that attracts foreign investments.

GCT was used to discover this relation. The study showed that unemployment rate was a factor that influenced on the FDI inflows and that historical data of unemployment can be used as a base for predicting the future values of FDI inflows in China, India and Singapore.

At the end, we would like to point out some restrictions of the research. Namely, due to the limitation of available data we were only able to collect data for total unemployment rates in the countries, and not for different types of unemployment: structural, cyclical and frictional. We are aware that the research result would have been more reliable if we were able to conduct analysis taking into consideration the impact of the different types of unemployment. Also, we must note that due to the unavailability of the data for the specific – labour intensive FDI, we explored the inter-relationship between the total FDI and unemployment. Furthermore, the data about FDI are only available on yearly bases, which is also limitation, especially if the GCT is used, that is why we have also checked the co-integration between the variables. Additionally, the study includes only the analysis of the countries with low labour cost. With the aim to overcome this limitation, in our next research paper we will analyse the inter-relationship between the FDI and unemployment rate in countries with higher labour cost. Finally, as we noted before the other factors such as tax burden, contracts, country risk can also influence on the result, but we will investigate the impact of this variables in our future research analysis.

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