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Referee report on the dissertation

“Essays on Labor Economics: Labor Market Laboratory in Central Europe”

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The dissertation of Marián Dinga discusses several interesting issues concerning the attraction and distribution of Foreign Direct Investment (FDI). As the author correctly mentions, economic integration and FDI poses an important factor for labor markets and the development of regional units at different geographical and administrative levels. Hence, it is very valuable that Mr. Dinga delivers a tripartite analysis covering various dimensions of FDI, i.e. within the framework of a single greenfield investment, but also on the regional and the national scale. In Chapter 1 the author investigates the impact of FDI on different labor market indicators in the district of Kolín after the establishment of a new automobile plant. While Chapter 2 concentrates on the distribution of FDI in Czech regions with regard to investment incentives, the effect of EU membership and the common euro currency on the reallocation of FDI is focused on in Chapter 3.

Chapter 1 provides a case study, the location of Toyota Peugeot Citroën Automobile (TPCA) in the Central Bohemian district of Kolín. Concentrating on a single investment in one district entails the advantage that the specific on-site conditions can be investigated in detail. After overviewing the literature concerning FDI effects on different issues and some basic facts about the economic situation in the district of Kolín the author explains the empirical strategy. Using advanced estimation methods Mr. Dinga elaborates a profound analysis of labor market effects after the inflow of FDI in Kolín.

The presented results seem plausible as they show a relatively beneficial development of labor market indicators after the TPCA investment. An essential question is whether the treatment “group” and the control group are differentiated in an adequate way. As there is in this particular case only a single district receiving treatment the challenge consists in finding twin districts of Kolín. It is of vital importance that all relevant variables for receiving treatment

(FDI) and influencing the labor market situation (unemployment, employment, outflow, inflow, duration) are considered.

This requirement could be put into question regarding the small number of covariates in the probit estimation. The counterfactual situation, i.e. what amount of FDI would have been realized in Kolín without the TPCA investment is hardly quantifiable. Subtracting the TPCA investment from overall investment in Kolín (footnote 22, p. 18) does not take into account that probably a further part of FDI can be ascribed to foreign-owned suppliers of TPCA. As workers and unemployed people from other districts in the Czech Republic were also attracted by the investment in Kolín the regression could lead to underestimated effects.

However, by defining three control groups, using a difference-in-differences approach and inspecting aggregate exit hazard rates the author makes exhaustive investigations in order to detect the effects of FDI in Kolín. Therefore, Mr. Dinga unquestionably provides a considerable contribution to the research on the impact of foreign companies in the Czech Republic.

Chapter 2 addresses the impact of investment incentives on the regional distribution of FDI in the Czech Republic. Mr. Dinga explicitly illuminates the requirements for FDI subsidies in the Czech Republic inclusive of the legislative changes in time. Convincingly, the author explains why to use, among others, a regression-discontinuity approach.

The results of all applied estimation methods, however, seem somewhat poor. Low values of the R-squared indicate that only a small proportion of the variance of FDI inflows is explained by the incorporated variables. Only in a few estimation versions some variables exhibit significant coefficients. Strikingly, the signs of the coefficient values are very unstable throughout the different regressions. Besides, it is not quite clear why in the different regression steps the observations are split into different periods of time (1998-2002 and 2003-2007 versus 2001-2004 and 2005-2007).

Altogether, the question can be raised whether the set of control variables is sufficient for the pursued research goal. Some variables appear a little bit thick-featured in order to control for the mentioned economic factors. Using the 1996 value for indicating the presence of a highway might, for instance, distort the real situation in the observed period, as a lot of road construction was conducted in the late 1990s. The inclusion of a dummy for districts that border on Germany and/or Austria standing for the proximity to the EU-15 markets is highly favourable. However, it is a very rough measure, since economic conditions profoundly differ across the border, e.g. between western and eastern Germany. On the one hand, there are actually well-founded reasons to exclude the cities of Prague, Brno and Ostrava. On the other hand,

also the districts around these cities are probably affected by the agglomerations, i.e. a foreign firm could explicitly decide to invest in a district close to large cities taking advantage both of agglomerative forces and lower costs for rents compared to locations directly in the cities. Therefore, it should also be controlled for the transport distance to the main cities. As the author mentions, the investigation concentrates on FDI incentives within the Czech Republic not taking into account the stimulation of FDI beyond the border. Alluring foreign companies, for instance, to districts in Northern Bohemia and Northern Moravia facing high unemployment rates probably is considerably affected by the incentive structure in the German and/or Polish borderland.

Chapter 3 deals with the effect of euro implementation on the allocation of FDI in OECD and European countries. The advantages of a common currency are convincingly expressed. Nevertheless, there are also potential disadvantages for firms after the introduction of the euro, e.g. improved export conditions occurring through the devaluation of the national currency are not possible anymore. Generally, single countries hand over intervention possibilities regarding the legal means of payment by joining a monetary union.

The application of Propensity Score Matching depends on the fulfillment of some essential assumptions. According to the *Conditional Independence Assumption* (CIA) the potential amount of FDI in the case of not belonging to the eurozone has to be equal for eurozone countries and non-eurozone countries so that the latter can serve as an adequate control group. It is assumed that all influencing factors are included in the analysis and thus differences in the magnitude of acquired FDI can be traced back exclusively to using the common euro currency. The *Common Support Assumption* (CSA) demands that countries with the same values for the relevant covariates have a positive probability of being both members and non-members of the eurozone. The *Stable Unit Treatment Value Assumption* (SUTVA) requires that the outcome, i.e. the acquisition of FDI, of a country belonging to the eurozone, is not affected by another country's state of being or not being a member of the eurozone.

This last assumption probably does not hold concerning the object of research in the paper. In fact, it can be assumed that the decision of a certain country whether or not to introduce the euro has an impact on FDI flows between other countries too. Furthermore, it is very questionable if "similar country-pairs" only differing in the adoption of the euro can be found, i.e. whether really all relevant variables for implementing the euro are considered. Aside from GDP the probit equation estimating the probability of both countries belonging to the eurozone contains only variables reflecting geographical or cultural features of the countries. The

precondition for the implementation of the euro, however, was the fulfillment of the Maastricht Convergence Criteria concerning inflation rates, government finance, exchange rates and long-term interest rates. Thus, the members of the eurozone share a long history of adjusting economic key parameters, which led, for example, to lower exchange rate volatility long before the introduction of the euro. Basically, it can be argued that there are two separate euro effects at work: on the one hand, a volatility effect after the fixing of exchange rates in 1999 and on the other hand, a common currency effect after the issue of euro bank notes in 2002. Beside the common currency the countries of the eurozone are affiliated with each other through deeper trade relations and lower barriers to the cross-border movement of employees. Since the lifting of trade and mobility impediments and the implementation of the euro came into force at the same time at least for some countries, it is arguable to ascribe the effect on FDI solely to the euro.

With respect to the differentiation between EU and eurozone countries it has to be noted that the eurozone countries in the data set are a subset of the EU countries. Therefore, it is possible that the EU dummy catches the euro effect. Regarding the estimations solely for EU member states, the countries not belonging to the eurozone include seven eastern European and only three western European countries (UK, Denmark, Sweden). This might be an explanation why FDI flows between eurozone countries are larger, as the number of multinational firms, capital endowment etc. is higher in western EU countries. Generally, results of different subsamples have to be interpreted with caution. With regard to the separate estimations for the period 1997-2003 it is important to recognize that the EU dummy covers a different set of countries than in the years afterwards. In principle, the outcome of the estimations including only EU countries and dropping countries like, for instance, the U.S., Canada and Australia are hardly comparable to the regressions using the full data set.

Summarizing, Mr. Dinga delivers very valuable contributions to the ongoing research on Foreign Direct Investment. It is of great convenience that the author performs cost-benefit calculations and derives policy implications. Thereby, Mr. Dinga evaluates the rationality for countries whether and in what way to provide incentives to foreign companies. In some cases, it would be useful to differentiate between vertical and horizontal FDI. Admittedly, this is a high demand with respect to the available data. All things considered, it is beyond all question that the thesis of Mr. Dinga undoubtedly warrants a dissertation defense and the subsequent award of a doctoral degree.

Smaller points:

- Either English or Czech language should be consistently used, e.g. regarding the names of the Czech regions (Chapter 1, p. 40, Table 1.6; Chapter 2, p. 83, Tables 2.7 & 2.8).

- With regard to the references the following cited articles are already published in refereed journals and should be cited correspondingly:
 - Chapter 2 and 3: Blonigen, B., 2005. A Review of the Empirical Literature on FDI Determinants. *Atlantic Economic Journal*, 33(4), 383-403.
 - Chapter 2: Imbens, G., Lemieux, T., 2008. Regression Discontinuity Designs: A Guide to Practice. *Journal of Econometrics*, 142(2), 615-635.
 - Chapter 2: Lee, D., Lemieux, T., 2010. Regression Discontinuity Designs in Economics. *Journal of Economic Literature*, 48(2), 281–355.

- In Chapter 2, p. 63 (referring to Table 2.8, p. 83) the statement “first, except for Středočeský and Moravskoslezský region, a vast majority of investment inflow during 1999-2006 was supported by the state” is not in line with the figures in Table 2.8. There are other regions where the proportion of supported FDI is even lower than in the Středočeský region, e.g. the Jihočeský region and the Zlínský region.

- Chapter 2, p. 85: Why are there 1480 observations for the years 1998-2007? After the exclusion of the cities of Prague, Brno and Ostrava 74 districts remain in the data set, i.e. a period of ten years of observation should result in N=740.

- In Chapter 2, the note in Table 2.11 refers to time-invariant variables which drop out by performing a fixed-effects estimation.

- Chapter 3, p. 90: The last paragraph announces that Section 5 is devoted to identification strategy and Section 6 describes the data. Actually, in the paper it is the other way around.

- Chapter 3, p. 97: In contrast to all other variables, there is no evaluation what result is expected for the border dummy.

- Chapter 3, p. 98: The analysis comprises 35 countries instead of 38 countries mentioned in the introduction on page 2.

- Chapter 3, p. 98: It does not become clear, which values for country-pairs are missing in the unbalanced panel. If all information for 35 countries was available, then more than 14,000 observations should be included in the data set (595 country pairs x 12 years x 2 in- and outflow). Therefore, apart from the missing data for the countries mentioned in footnote 20, there is quite a shortfall of data which should be explained. In footnote 25 (p. 101), for instance, 13,977 observations are mentioned.

- Chapter 3, p. 98: In footnote 19, six instead of five non-OECD countries are named.

- Chapter 3, p. 105: In contrast to footnote 29, there are formal agreements between the European Central Bank (ECB) and Vatican City, San Marino and Monaco concerning the use of the euro as legal tender.

- Chapter 3, p. 112: Table 3 is not referred to in the text.