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The Effects of Greenfield FDI and Cross-Border M&As on Government Size

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Abstract

This study examines the effects of greenfield FDI and cross-border mergers and acquisitions (M&As) on government size in host countries of FDI. Using panel data for up to 135 countries for the period from 2003-2012, the study specifically tests the *compensation hypothesis*, suggesting that by increasing economic insecurity, economic openness leads to larger government size. It is found that greenfield FDI increases labour market volatility and thereby economic insecurity while M&As are not significantly associated with labour market volatility. The main results of this study are that greenfield FDI has a robust positive effect on government size, while M&As have no statistically significant effect on government size in the total sample of developed and developing countries, as well as in the sub-samples of developed and developing countries.

Keywords: greenfield FDI; cross-border M&As; government size

JEL classification: F21; F23; E62

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1. Introduction

The effects of the openness of the economy on government size have been one of the main issues in political economic studies over the last few decades. One hypothesis, known as the *compensation hypothesis*, postulates that increasing openness of the national economy increases the demand for greater welfare spending as a form of social insurance against growing economic insecurity (Garrett, 1998; Rodrik, 1998). A second hypothesis, the so-called *efficiency hypothesis*, maintains that increased competition in the international goods and services markets, along with the ability of the holders of capital to relocate money and production around the world, leads governments to reduce welfare spending programmes by increasing pressure to reduce taxes (Garrett and Mitchell, 2001).

In testing the empirical validity of these hypotheses, a large number of studies has examined the effects of trade openness or capital openness on government size (e.g., Alesina and Wacziarg, 1998; Benarroch and Panday, 2012; Down, 2007; Dreher, Sturm, and Ursprung, 2008; Garrett and Mitchell, 2001; Liberati, 2007; Rodrik, 1998). However, studies on the impact of inward foreign direct investment (FDI) on government size are scarce. It appears that only Gemmel, Kneller, and Sanz (2008) have examined the effect of inward FDI on government size. Using a sample of 15 Organisation for Economic Cooperation and Development (OECD) countries, they find that FDI has no effect on government size; however, FDI significantly shifts the expenditure composition towards social spending.

In this paper, total FDI inflows are decomposed into greenfield FDI and cross-border mergers and acquisitions (M&As) to investigate whether these two different types of FDI generate different demands for government size by affecting economic insecurity differently. By definition, greenfield FDI is new investment that brings additional production capacity, whereas M&As only involve a change of existing assets and production capacity from local to foreign hands. Therefore, both of these modes of entry of FDI are assumed to affect market

structure of the host country differently. Furthermore, greenfield FDI and M&As differ considerably in the motives of the firms which engage in these investment modes (Nocke and Yeaple, 2008). These reasons may give rise to the assumption that greenfield FDI and M&As have disparate affects on labour market volatility, and thereby on economic insecurity and government size. Specifically, this study hypothesizes (as discussed in detail in Section 2) that greenfield FDI generates economic insecurity to a greater degree than M&As. Therefore, greenfield FDI leads to greater demand for larger government size than M&As do. Thus, combining both modes of entry into a single measure of total FDI in testing the empirical validity of the compensation hypothesis may give rise to ambiguous results. Surprisingly, however, there are until now no studies examining the separate effects of greenfield FDI and M&As on government size.

The current paper thus contributes to the literature in a number of ways. First, it is the first to investigate the effects of total FDI, greenfield FDI, and M&As on government size in a large sample of (up to 135) developed and developing countries. The main goal of the paper, however, is to examine whether the two modes of FDI entry disparately affect labour market volatility, and thereby economic insecurity and government size. The sample used in the analysis covers the period from 2003 through 2012. The two modes of entry show a different pattern of flows over the sample period. The volume of greenfield FDI is more volatile than the volume of M&As inflows, as indicated by the calculated standard deviations. The standard deviation of greenfield FDI (as a percentage of GDP) is 10.26, while in contrast, the standard deviation of M&As (as a percentage of GDP) is 6.62. This may give rise to the idea that both modes of entry of FDI affect economic insecurity differently.

Second, in most of the existing studies examining the effects of economic openness on government size, it is implicitly assumed that openness increases economic insecurity without testing this transmission mechanism (e.g., Benarroch and Panday, 2012; Gemmel et al., 2008,

among others). In the present study, the effects of the two modes of entry of FDI on economic insecurity are explicitly analysed in a first step by examining the effects of greenfield FDI and M&As on labour market volatility. In this respect, this analysis is the first to investigate the effects of the different modes of entry of FDI on labour market volatility, and thereby on economic insecurity.

Lastly, two sub-samples of developed and developing countries are also considered to examine whether the effects of greenfield FDI and M&As on government size are the same for both of the country groups. The composition of FDI inflows differs considerably between the two sub-samples over the sample period from 2003 to 2012. The ratio of greenfield FDI to the sum of the flows of both types of FDI is 88 percent in developing countries (approximately eight times more than that of M&As). In contrast, M&As are the dominant FDI type for developed countries (57 percent of the inflows of both types).

It is found that greenfield FDI has a positive effect on labour market volatility, and thus on economic insecurity, while, in contrast, M&As do not have a statistically significant effect on labour market volatility. The results of the main analysis are that M&As do not have a statistically significant effect on government size, while greenfield FDI has a robust positive effect on government size in the total sample of developed and developing countries, as well as in the two sub-samples of developed and developing countries. Given the positive effects of greenfield FDI on economic insecurity and government size, this study finds support in favour of the compensation hypothesis, and thus rejects the efficiency hypothesis.

The rest of the paper is organised as follows: in Section 2, the relevant literature is reviewed and the hypothesis that greenfield FDI increases labour market volatility, and therefore economic insecurity and government size more than that of M&As is drawn; Section 3 presents the empirical analysis, while Section 4 concludes.

2. Theoretical Background and Related Literature

The argument explaining the positive effect of openness of the economy on government size (known as *compensation Hypothesis*), proposed by Rodrik (1997, 1998) and Garrett (1998) suggests that international economic integration brings domestic economies into greater economic volatility, implying greater income and employment risks for workers. This increase in economic insecurity, stemming from higher economic volatility, generates demands for larger government size as a form of insurance that compensates workers for such risks. It has been argued that workers perceive economic insecurity from volatility of labour market outcomes, i.e., volatility of employment and/or wages (see e.g., Scheve and Slaughter, 2004), and this exposure to risk in the labour market is a powerful determinant of people's preferences for state protection and public risk sharing (Iversen and Cusack, 2000; Rodrik, 1998).

FDI inflows may increase the demand for larger government size by increasing labour market volatility, and thereby economic insecurity. The important point is that there are strong reasons to assume that the effects of FDI on labour market volatility may differ, depending on the mode of entry of foreign firms into the host countries; foreign firms may enter in the form of either greenfield investment, which involves building new production facilities, or M&As, which means the transfer of ownership of existing assets from local to foreign hands. In the following, the potential channels of the effects of FDI inflows on labour market volatility and their implication for the different modes of entry are discussed in detail. These channels are grouped into two headings: *elasticity of labour demand* and *volatility of FDI flows*.

2.1. Elasticity of labour demand

FDI may increase wage elasticity of labour demand in the host country. Higher wage elasticity of labour demand, in turn, increases the responsiveness of wages and employment to

a given shock to labour demand (Rodrik, 1997; Scheve and Slaughter, 2004). Thus, by making labour demand more elastic, FDI inflows lead to more volatile labour market outcomes and increased economic insecurity.

Greater FDI inflows can increase wage elasticity of labour demand both through the *scale effect* and the *substitution effect*. According to the *scale effect*, FDI inflows are expected to increase competition in the product market. This increase in competition raises product-demand elasticity, and thereby leads to a larger decline in output and demand for labour in response to a given increase in wages, and thus costs (Fabbri, Haskel, and Slaughter, 2003). The *substitution effect*, on the other hand, captures the extent to which firms substitute labour with other factors of production in response to an increase in wages. FDI by multinational firms increases the wage elasticity of labour demand through the substitution effect by substituting foreign workers for domestic workers, by partially or completely transferring production abroad in response to increase in wages in the host country. The basic idea is that multinational firms are part of global production networks and within these production networks, firms can easily and rapidly transfer production, either partially or completely, across borders (Fabbri et al., 2003; Scheve and Slaughter, 2004).

Turning to the effects of different modes of FDI entry into host countries on labour market volatility, and thereby on economic insecurity, it is argued that since greenfield FDI creates new capital assets and additional production capacity, and given that M&As are the transfer of ownership of existing assets and production capacity from local into foreign hands, greenfield FDI brings greater competitive pressure than that of M&As (UNCTAD, 2000). M&As are even assumed to reduce competition in the host country since, while greenfield FDI expands productive capacity, a larger share of M&As sales merely represents a rent that accrues to incumbent owners (Harms and Méon, 2011). Along these lines, Mattoo, Olarreaga, and Saggi (2004), model the relationships between the two modes of entry of FDI, technology

transfers, and market structure. They argue that the competition-enhancing effect of greenfield FDI is clearly greater than that of M&As.

There are few empirical studies that address the effects of different modes of FDI in the host country. In sum, these studies point out that greenfield FDI generates competitive pressure, while M&As do not. For example, using data on Norwegian firms, Balsvik and Haller (2010) examine the productivity effects of the two different modes of foreign investment entry. They find that greenfield entry, both in the same industry and in the same labour market region, has a negative impact on the productivity of domestic plants, while entry via acquisitions positively affects the productivity of domestic plants in the same industry. Further, Ashraf and Herzer (2014) examine the effects of greenfield investment and M&As on domestic investment in developing countries. Their results indicate that greenfield investment crowds out domestic investment, while M&As do not have a significant effect on domestic investment. Using a large sample of 123 developed and developing countries, Ashraf, Herzer, and Nunnenkamp (2014) show that although M&As increase total factor productivity in developed countries, greenfield FDI does not have any effect on total factor productivity in developed or in developing countries.

These theoretical and empirical arguments suggest that it is reasonable to assume that greenfield FDI makes labour demand more elastic with respect to wage via the scale effect than M&As.

From a theoretical point of view, the effects on wage elasticity of labour demand through the substitution effect may differ between greenfield FDI and M&As due to the motives of the firms which engage in these modes; firms that engage in greenfield FDI and in M&As have different motives for entering in the foreign markets. As indicated in the introduction, greenfield FDI contributes a much larger share to total FDI flows in developing host countries than do M&As. On the one hand, this could suggest that, in comparison to the

firms that engage in M&As, the firms involved in greenfield FDI are largely driven by production-cost differences between countries (vertical motive). On the other hand, a much larger share of M&As to the total FDI flows in developed host countries than to those in developing countries indicates the asset-seeking or horizontal motive of the firms engaging in M&As. These arguments can also be justified by the model of Nocke and Yeaple (2007). Explaining the choice of entry mode of U.S. firms into foreign markets, the Nocke and Yeaple model predicts that when production cost differences between countries are small, most FDI takes the form of cross-border acquisitions, while greenfield FDI plays a more important role for FDI from high-cost into low-cost countries.¹ Wes and Linkes (2001) conduct a survey analysis in transition economies to analyse the determinants of entry mode choice of foreign firms. They also find that while production costs are only of moderate importance in the case of M&As, they are of much greater importance for greenfield investors.

This might suggest that the firms which engage in greenfield FDI are more responsive to changes in wages in the host countries by transferring production abroad, and therefore exhibit higher wage elasticity of labour demand than firms which engage in M&As.

Greenfield FDI and M&As may also affect wage elasticity of labour demand via the substitution effect differently due to the linkages with the local economy which the firms that engage in these modes develop. Görg, Henry, Strolb, and Walsh (2009), using a plant-level data set for manufacturing plants in the Republic of Ireland, find that labour demand in multinationals becomes less elastic with respect to wage if the plant has backward linkages with the local economy. The reason could be that locally purchased inputs may be more difficult to substitute for labour than are other inputs, owing to the very nature of the inputs (Görg et al., 2009). Since the firms involved in M&As work more with local and regional

¹ To the extent that production cost differences reflect underlying wage differentials, this prediction of the Nocke and Yeaple (2008) model is consistent with their empirical observation that U.S. multinationals are more likely to favour cross-border acquisitions over greenfield FDI in wealthy, developed countries, rather than in poor developing countries, in which greenfield FDI is preferred.

suppliers than firms involved in greenfield FDI, and since greenfield enterprises rely more heavily upon imported supplies (Wes and Linkes, 2001), it might be reasonable to assume that the firms which engage in greenfield FDI exhibit higher wage elasticity of labour demand than firms which engage in M&As.

These theoretical arguments might suggest that in comparison to M&As, greater greenfield FDI inflows make labour demand more elastic with respect to wage through the substitution effect, and thus generates more economic insecurity because of the more volatile income and employment outcomes to a given shock to labour demand. However, and surprisingly, there are no empirical studies comparing the labour demand elasticities between the firms that engage in greenfield FDI and in M&As.

2.2. Volatility of FDI flows

FDI may also increase labour market volatility (and therefore economic insecurity) because of the volatility of FDI flows due to other reasons. Foreign firms may also be “footloose” in response to a decrease in production costs elsewhere (Girma and Görg, 2007; Görg et al., 2009). The assumption of being “footloose” is based on the premise that multinational firms locate abroad only those production processes which are easily transferable between countries, and this makes it easy for them to shift production from one host country to another (Görg and Strobl, 2003). Similarly, foreign firms may establish subsidiaries in host countries in response to an increase in production costs elsewhere.

Lensik and Morrissey (2004) argue that although FDI is assumed to be less volatile than other private capital flows, sudden changes in the volume of FDI inflows can nonetheless have a destabilising impact on the domestic economy. Following the endogenous growth literature on FDI, they argue that uncertainty in FDI inflows causes uncertainty in research

and development costs, and thereby affects economic growth negatively by reducing incentives to innovate.

As indicated in the introduction, the volume of greenfield FDI is more volatile than the volume of M&As. This implies that it is reasonable to assume that greenfield FDI increases labour market volatility (and therefore economic insecurity) more than M&As do. The same might also be inferred from the study of Burger and Ianchovichina (2014). They examine whether extreme fluctuations—surges (sudden increases) and stops (sudden decreases)—in FDI inflows are led by waves in greenfield investment or M&As. A surge (stop) is *greenfield-led* when more than half of the increase (or decrease) in FDI can be attributed to an increase (or decrease) in greenfield investment. Similarly, a surge (stop) is *M&As-led* when more than half of the increase (or decrease) in FDI can be attributed to an increase (or decrease) in M&As activity. Their analysis shows that greenfield-led extreme events (surges and stops) occur more frequently than do M&As-led ones.²

One reason why greenfield FDI is more volatile than that of M&As could be that greenfield FDI is more of a vertical-type FDI, while M&As are involved more in horizontal-type FDI (as argued in Section 2.1). Since the determinants of vertical FDI (such as wage differentials) change more often as compared to the determinants of horizontal FDI (such as market size), greenfield FDI is more volatile than M&As.

Based on the arguments described above, it is hypothesized that greenfield FDI increases labour market volatility, and thereby economic insecurity and government size, more than M&As.

² The unconditional probability of experiencing a surge in greenfield investments and M&As was 11.7% and 3.2% , respectively, while the unconditional probability of experiencing a greenfield-led stop was 12.8%, and for M&As, 3.3%.

3. Empirical Analysis

This section investigates the effects of total FDI, greenfield FDI, and M&As on government size in the host countries of FDI. The main focus of the study is to determine whether the two different modes of entry of FDI generate different demands for government size by affecting economic insecurity differently. Therefore, as a first and preliminary step, the effects of greenfield FDI and M&As on labour market volatility are examined (Section 3.1). Subsequently, a detailed analysis of the effects of total FDI inflows, greenfield FDI, and M&As on government size is presented (Section 3.2).

3.1. The effects of greenfield FDI and M&As on economic insecurity

To determine the effects of different modes of entry of FDI inflows on economic insecurity, the effects of greenfield FDI and M&As on labour market volatility are examined. The model is of the general form

$$Vol_{it} = \beta FDI_{it} + \sum_{m=1}^M \gamma_m X_{mit} + \mu_i + \lambda_t + \varepsilon_{it}, \quad (1)$$

where $i = 1, 2, \dots, N$ is the country index, $t = 1, 2, 3, \dots, T$ is the time index, and Vol represents labour market volatility. *Volatility of employment* is used as a measure of labour market volatility; *employment* represents the total number of people employed.³ Following Buch and Pierdzioch (2014), and Buch and Schlotter (2013), among others, *Volatility of employment* is defined as a five-year moving standard deviation of employment growth.

FDI represents the two different modes of entry of FDI. The first variable is greenfield investment, *Greenfield*, and the second is cross-border M&As, *M&A*. Both of these variables are expressed as a percentage of GDP. To avoid multicollinearity due to complementarities

³ Since there is a lack of comparable cross-country data on wages, particularly for developing countries the focus is on employment volatility.

between the two different modes of entry, estimations for *Greenfield* and *M&A* are performed separately, as suggested by Calderón, Loayza, and Servén (2004).

X is the usual vector of m time-varying control variables. There is control for volatility of output (measured as a five-year moving standard deviation of growth of real GDP per capita), *Vol of output*, trade openness (the sum of imports plus exports as a percentage of GDP), *Trade*, and Governance, *Govern*. Following common practice in panel data analysis, fixed effects, μ_i , are included to control for any country-specific omitted factors that are stable over time. Also included are period dummies, λ_t , to account for common time effects affecting all countries simultaneously.

Data on the value of greenfield FDI projects and on cross-border M&As sales are from the United Nations Conference on Trade and Development (UNCTAD) database.⁴ UNCTAD's cross-border M&As sales data refer to the net sales by the region/economy of the immediate acquired company and are based on information provided by Thomson Reuters. These data cover only those deals involving acquisition of an equity stake of more than 10 percent. The data on greenfield FDI are based on information provided by fDi Markets of the Financial Times. One important point here is that the sum of greenfield FDI and M&As often exceeds net FDI inflows, as reported in the balance-of-payments statistics. The reason is that the datasets on greenfield FDI and M&As may include transactions via domestic and international capital markets which are normally not considered FDI flows.

The data on employment are from the Penn World Table (PWT), version 8.0 (Feenstra, Inklaar, and Timmer, 2013).⁵ The data on real GDP per capita and trade openness are from the World Development Indicators 2015 online database.⁶ For the measure of governance, data on regularity quality constructed by Kaufman, Kraay, and Mastruzzi is

⁴ Available at: <http://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx>.

⁵ Available at: <http://www.rug.nl/research/ggdc/data/penn-world-table>.

⁶ Available at: <http://data.worldbank.org/data-catalog/world-development-indicators>.

obtained from the Worldwide Governance Indicators project.⁷ These data capture perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufmann et al., 2015). Specifically, it covers the incidence of market-friendly policies in areas such as foreign trade and business development.

The dataset consists of an unbalanced panel of up to 135 countries for the period from 2003-2012. A list of the countries included in the sample is provided in Appendix A.

Table 1 presents the estimation results. Results are reported with and without control variables. As can be seen, across the specifications presented in Table 1, the coefficient on greenfield FDI is positive and significant, while the coefficient on M&As is negative but insignificant, suggesting that greenfield FDI increases labour market volatility, and therefore economic insecurity, while, M&As do not have a significant effect on labour market volatility.

The signs on the coefficients of the control variables are in accordance with the expectations. As in previous studies (for example, Buch and Schlotter, 2013; Buch and Pierdzioch, 2014) the coefficient on volatility of output is positive and significant in all regressions presented in Table 1. Trade openness is found to be positively and significantly related to employment volatility. This finding provides support for the idea that international trade in final goods increases labour market volatility by increasing elasticity of labour demand, or by increasing shocks to labour demand (Rodrik, 1998; Scheve and Slaughter, 2004). Further, the coefficient on governance suggests that by providing favourable conditions to potential investors, good governance reduces labour market volatility.

[Table 1 about here]

⁷Available at:
<http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=worldwide-governance-indicators>.

3.2. The effects of greenfield FDI and M&As on government size

To examine the effects of total FDI, greenfield FDI, and M&As on government size, the baseline specification is the model of the general form

$$G_{it} = \beta FDI_{it} + \sum_{m=1}^M \gamma_m X_{mit} + \mu_i + \lambda_t + \varepsilon_{it}, \quad (2)$$

where i and t are, as before, country and time indices, and G represents government size. Following common practice in the literature (e.g., Alesina and Wacziarg, 1998; Ram, 2009; Rodrik, 1998, among others), general government final consumption expenditures as a percentage of GDP are used as a measure of government size. In this model, FDI represents total FDI, FDI_{total} , $Greenfield$, and $M\&A$. As mentioned before, separate estimations for greenfield investment and for M&As are performed to avoid multicollinearity.

X is again the vector of m time-varying control variables that are most commonly used in the existing literature. These variables include the age-dependency ratio (ratio of people younger than 15 or older than 64 to the working age population), *Dependency*, GDP growth, *Growth*, the urbanisation rate (urban population as a percentage of total population), *Urbanisation*, the unemployment rate, *Unemployment*, and control of corruption, *Corruption*. As in Equation 1, fixed effects, μ_i , and period dummies, λ_t , are included.

The data on total FDI inflows are from UNCTAD. These data represent the net inflows of investment (new investment inflows less disinvestments) to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in a foreign economy (one other than the investing company's economy). The data on GDP growth, the age-dependency ratio, the urbanisation rate, and the unemployment rate are from the WDI 2015 online database. The measure of control of corruption constructed by

Kaufmann, Kraay, and Mastruzzi is from the Worldwide Governance Indicators project.⁸ These data capture perceptions of the extent to which public power is exercised for private gain, including grand corruption, as well as capture of the state by elites and private interests (Kaufmann et al., 2015). Appendix B shows some summary statistics on the main variables used in the analysis.

a. Baseline Results

The baseline results are presented in Table 2. Again, both results with and without control variables are reported. The signs on the coefficients of control variables are in line with previous studies. Similar to Dreher (2006) and Garret and Mitchell (2001), the sign on the coefficient of GDP growth is negative in Column 2 and Column 4, but, in contrast, is positive in Column 6. Its effect however is statistically insignificant in all regressions, whereas Dreher (2006) and Rudra (2002) find that GDP growth is significantly negatively related to government size in the OECD countries. As is the case in many previous studies (for example, Rodrik, 1998; Shelton, 2007), the coefficient of the age-dependency ratio is positive and significant in all specifications. With regard to the urbanisation rate, similar to Avelino, Brown, and Hunter (2005), the sign of the estimated coefficient is positive and statistically significant in all specifications presented in Table 2. The coefficient on the unemployment rate is positive, although its effect is not statistically significant in all regressions. Finally, the positive and highly significant coefficient on control of corruption suggests that lower levels of corruption increase government size. This finding is in line with the results of Mauro (1998), suggesting that corruption does affect the composition of expenditures; in particular, education spending is adversely affected by corruption.

⁸ The data are available at <http://info.worldbank.org/governance/wgi/index.aspx#home>.

Turning to the main variables of interest, the coefficient on total FDI is positive and significant without control variables (Column 1). However, it does not remain significant at the 5-percent level when control variables are added. This finding is in line with the results of Gemmell, et al. (2008). Comparing the results of the different modes of entry of FDI inflows, the coefficient on greenfield FDI is positive and significant across all specifications presented in Table 2, while the coefficient on M&As is negative and insignificant for all specifications. This suggests that greenfield FDI increases government size while, in contrast, M&As do not have any statistically significant effect on government size. The point estimate implies that a one-percentage-point increase in the greenfield FDI-to-GDP ratio increases the government consumption expenditure-to-GDP ratio by 0.028 percentage points.

The standardised coefficients of the model in Column 4 are reported in Column 7 of Table 2. These coefficients are calculated by multiplying the unstandardised coefficients by the ratio of the standard deviations of the independent and dependent variables. These coefficients suggest that the estimated size of the effect of greenfield FDI on government size (0.051) is about one-fourth of that of the dependency ratio (0.235), about one twenty-fifth of the urbanisation rate (1.305), and one-third of control of corruption (0.195).⁹ This suggests that, overall, the magnitudes are not implausible.

[Table 2 about here]

b. Robustness

As a first robustness check of the results that greenfield FDI increases government size while M&As do not have any effect, the baseline model is augmented with three additional control variables commonly used in the existing literature (e.g., Alesina and Wacziarg, 1998;

⁹ The standard deviations of the variables are reported in summary statistics (Appendix B).

Dreher et al., 2008 among others). These include inflation, *Inflation*, the domestic lending interest rate, *Interstrate*, and population density (population divided by area), *Density*.¹⁰

The results of this exercise are presented in Table 3. The effects of the additional variables are in accordance with the expectations. The coefficients on population density and the lending interest rate are negative and significant, while the coefficient on inflation is insignificant. Turning to the variables of major interest, the coefficient on greenfield FDI is again positive and significant while, in contrast, the coefficient on M&As is insignificant for all specifications. The results are thus consistent with those reported in Table 2.

[Table 3 about here]

Next, the sensitivity of the results to alternative estimation approaches is evaluated. First, the robustness of the results to the use of a dynamic panel data model is investigated by including a lag of government size (*Lagged G*) among the explanatory variables in Equation 2. The inclusion of *Lagged G* explicitly accounts for the dynamic process of government size increase and also helps control for the effects of potentially relevant omitted variables and serial correlation in the disturbance term. Furthermore, it also allows for studying the long-run effects of explanatory variables on government size. A potential disadvantage of using a dynamic panel data model, however, is that the standard fixed-effects estimator may be biased and inconsistent in the presence of a *Lagged G* because of Nickell (1981) bias; that is, the correlation between the lagged dependent variable and the fixed effects may bias the coefficient on the lagged dependent variable towards zero, when, as in the current dataset, the number of time periods is small.

¹⁰ The data on these variables are taken from the WDI online database.

Another disadvantage of the standard fixed-effects estimator is that it does not control for the potential endogeneity of FDI variables. FDI inflows may lead to a larger government size. However, a country with a larger government could also possibly attract more FDI by providing or maintaining infrastructure that is valued by foreign investors (Anyanwu, 2011). This could, in turn, explain the positive association between FDI and government size. Alternatively, to the extent that a larger government is perceived to be less efficient (Anyanwu, 2011) and also leads to higher taxes and higher real interest rates, FDI may go to countries with smaller governments, resulting in a negative association between FDI and government size. To address the potential endogeneity issue, a standard test of strict exogeneity is applied first by adding leads of FDI variables and testing their joint significance (Wooldridge, 2002). The null hypothesis of this test is that the variable of interest is strictly exogenous. The F statistic is 0.13 (with a p value of 0.88) with two leads, and 0.71 (with a p value of 0.55) with three leads of greenfield FDI, suggesting that greenfield FDI is strictly exogenous and can be interpreted causally. On the other hand, the F statistic is 4.10 (with a p value of 0.02) when two leads of M&As are used. In contrast, when three leads of M&As are used, the F statistic becomes 1.98 (with a p value of 0.12). This may suggest some probability that M&As are indeed endogenous.

Nevertheless, to address the endogeneity issue in a more systematic way, the dynamic model is re-estimated using the Blundell and Bond (1998) system GMM estimator for dynamic specification.¹¹ The advantage of using the system GMM estimator is that it is capable of overcoming the above-mentioned Nickel bias, to correct for the potential endogeneity of other explanatory variables, and to deal with the problem of measurement errors. Specifically, system GMM works as a system of two equations; one equation is in first differences, which removes the fixed effects, and the second equation is in levels, which

¹¹ The first-differenced GMM estimator suggested by Arellano and Bond (1991) can also be used. However, Arellano and Bover (1995) and Blundell and Bond (1998) suggest that system GMM is more efficient than differenced GMM in cases where the variables are very persistent.

brings in the technical gains of additional level moment conditions and increased efficiency (Hong and Sun, 2011). In system GMM regression, the potential endogeneity of the two FDI variables (greenfield FDI and M&As) is controlled.

A drawback to the system GMM estimation procedure is that the estimator can exhibit the problem of too many instruments and a large instrument collection can over fit endogenous variables (Roodman, 2009). There are no formal tests that can determine the number of lags that should be used as instruments. However, a rule of thumb is that the number of instruments should be less than the number of countries. To account for the problem of too many instruments, only the *Lagged G*, *GFI*, and *M&A* are instrumented with GMM-style instruments. Additionally, lags of only two periods are used.

The consistency of the system GMM estimator depends upon the validity of the instruments (i.e., if the lagged values of variables are valid instruments). In the existing literature, the validity of the instruments is usually addressed by performing two specification tests. The first is a Hansen-J test of overidentification restrictions that examines the validity of the full set of instruments, as well as the additional instruments that are introduced in the level equations. The second test is a second-order serial correlation test (AR2) which checks whether the first-differenced error term is second-order serially correlated.

Table 4 presents the results of system GMM estimation, together with the above mentioned tests. As can be seen, the Hansen test does not reject the null hypothesis of no overidentification and the AR2 test does not reject the null hypothesis of an absence of second-order serial correlation. This suggests that the models are correctly specified. Furthermore, in both regressions, the number of instruments is less than the number of countries.

The estimated coefficient on the lagged dependent variable is positive and significant, suggesting that the past levels of government size do affect its present level. Again, the

coefficient on greenfield FDI is positive and significant, and the coefficient on M&A is negative but insignificant. While the coefficient on greenfield FDI represents the short-run effect, the long-run effect of greenfield FDI on government size can be calculated by dividing the short-run coefficient by 1, minus the coefficient on the lagged dependent variable. Thus, the long-run effect of greenfield FDI on government size is 1.203.

Since the system GMM estimator may suffer from substantial finite sample biases due to weak instruments (see, e.g., Bun and Kiviet, 2006; Bun and Windmeijer, 2010), fixed-effects estimation results (presented in Table 2) are preferable to the system GMM estimation results. Another reason for this preference is that none of the other explanatory variables is statistically significant in Column 1.

[Table 4 about here]

c. Results for developed and developing countries

Rodrik (1998) finds that the positive association between economic openness and government size (measured as government consumption expenditures as a percentage of GDP) exists for both the high and low-income countries. The data are categorised into sub-samples (developed and developing countries) in order to examine whether the positive effect of greenfield FDI and an insignificant effect of M&As on government size hold for both sub-samples. The countries are included in the respective sub-samples of developed and developing countries according to the UNCTAD classification. A list of the classified countries is provided in Appendix A.

Table 4 presents the results for developed and developing countries. It can be seen that the sign and value of the coefficient on greenfield investment is virtually the same for both developed and developing countries, and it remains statistically significant for both sub-

samples. Although the sign of the coefficient on M&As is positive in developed countries and negative in developing countries, it remains statistically insignificant for both sub-samples. These results hold irrespective of whether the controls are included or not.

Hence, these results suggest that greenfield FDI has a positive and significant effect on government size in both developed and developing countries. However, M&As have no statistically significant effect on government size in either sub-sample.

[Table 5 about here]

4. Summary and Conclusion

The theoretical literature suggests that economic openness can affect government size in two ways. The argument proposed by the *compensation hypothesis* is that by increasing economic insecurity, openness of the economy increases demand for larger government size (Garret 1998; Rodrik 1998). On the other hand, the idea advanced in the so-called *efficiency hypothesis* maintains that the increased competitive pressure and lax nature of FDI put pressure on governments to reduce or to re-evaluate the expenditures which are unfavourable to investors in domestic economy (Garrett and Mitchell, 2001). In testing the empirical validity of these hypotheses, a large number of studies have examined the effects of trade openness or capital openness on government size. However, studies on the impact of inward FDI on government size are scarce.

In this paper, the effects of total FDI, greenfield FDI, and M&As on government size are evaluated. Specifically, the question is examined of whether the two different modes of entry of FDI (greenfield FDI versus M&As) generate different demands for government size by affecting economic insecurity differently, given that people perceive economic insecurity from labour market volatility (see e.g., Scheve and Slaughter, 2004) and this exposure to risk

in labour market is a powerful determinant of people's preferences for state protection and public risk sharing (Iversen and Cusack, 2000; Rodrik, 1998). The hypothesis of this paper is that greenfield FDI increases labour market volatility, and thereby economic insecurity and government size, more than M&As.

Using a large panel of up to 135 developed and developing countries over the period from 2003 to 2012, the effects of the two different modes of entry of FDI on economic insecurity are evaluated by examining the effects of greenfield FDI and M&As on labour market volatility. Then a detailed empirical analysis is conducted on the effects of total FDI, greenfield FDI, and M&As on government size. It is found that greenfield FDI increases labour market volatility, and therefore economic insecurity, while, in contrast, M&As do not have a significant effect on labour market volatility. The results of the main analysis are that greenfield FDI has a positive effect on government size, while M&As have no statistically significant effect on government size in the total sample of all developed and developing countries, as well as in the sub-samples of developed and developing countries. This may suggest that the aggregation of different modes of entry into a single measure of total FDI may lead to ambiguous or inconclusive results with respect to the question of the effects of inward FDI on government size.

Importantly, given the positive effects of greenfield FDI on economic insecurity stemming from labour market volatility, and government size, this study finds strong evidence in favour of the argument advanced in the compensation hypothesis, and thus rejects the efficiency hypothesis.

Appendix A: Countries in the Sample (2003-2012)

[Table A.1]

Appendix B: Summary Statistics

[Table A.2]

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Table 1. The effects of greenfield FDI and M&As on labour market volatility

	(1)	(2)	(3)	(4)
<i>Greenfield</i>	0.0001** (1.98)	0.0001** (2.15)		
<i>M&A</i>			-0.00004 (-0.60)	-0.00002 (-0.17)
<i>Vol of output</i>		0.132*** (9.41)		0.141*** (6.39)
<i>Trade</i>		0.0002*** (3.14)		0.0002*** (2.98)
<i>Govern</i>		-0.016*** (-3.31)		-0.017*** (-2.59)
No. of obs.	474	452	381	368
No. of countries	121	116	118	113
R-squared (within)	0.02	0.13	0.03	0.13

Notes: The dependent variable is *Vol*. Following Buch and Pierdzioch (2014), *Vol* is computed over a five-year moving window $[t, t+4]$ while the explanatory variables are measured in period t except *Vol of output*. *Vol of output* is also computed over a five-year moving window $[t, t+4]$. *T*-statistics (calculated with White standard errors) are in parenthesis. *** (**) indicate significance at the 1% (5%) level. Coefficients on country and time-fixed effects are not reported.

Table 2. The effects of total FDI, greenfield FDI, and M&As on government size: *Baseline results*

	(1)	(2)	(3)	(4)	(5)	(6)	(7) Standardised coefficients from column (4)
<i>FDItotal</i>	0.020*** (2.64)	0.018* (1.63)					
<i>Greenfield</i>			0.024** (2.31)	0.027** (2.24)			0.051
<i>M&A</i>					-0.005 (-1.15)	-0.006 (-1.26)	
<i>Growth</i>		-0.042 (-1.03)		-0.020 (-0.60)		0.002 (0.07)	
<i>Dependency</i>		0.064*** (3.43)		0.071*** (3.76)		0.044*** (3.30)	0.235
<i>Urbanisation</i>		0.236*** (7.02)		0.296*** (8.37)		0.060*** (2.48)	1.305
<i>Unemployment</i>		0.046 (1.00)		0.034 (0.69)		0.053 (1.30)	
<i>Corruption</i>		1.898*** (3.52)		1.010*** (2.74)		1.024*** (5.60)	0.195
No. of obs.	1234	1221	1179	1170	928	924	
No. of countries	131	130	130	129	128	127	
R-squared (within)	0.07	0.12	0.11	0.14	0.14	0.16	

Notes: The dependent variable is *G*. *T*-statistics (calculated with White standard errors) are in parenthesis. *** (**) [*] indicate significance at the 1% (5%) [10%] level. Coefficients on country and time fixed-effects are not reported.

Table 3. The effects of greenfield FDI and M&As on government size: *Additional control variables*

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Greenfield</i>	0.028** (2.27)	0.028** (2.25)	0.027** (2.22)			
<i>M&A</i>				-0.006 (-1.23)	-0.006 (-1.16)	-0.001 (-0.13)
<i>Growth</i>	-0.022 (-0.70)	-0.021 (-0.68)	-0.032 (-0.97)	0.002 (0.07)	0.003 (0.11)	-0.015 (-0.50)
<i>Dependency</i>	0.071*** (4.03)	0.064*** (3.97)	0.034** (2.15)	0.044*** (3.22)	0.035** (2.32)	0.029 (1.02)
<i>Urbanisation</i>	0.291*** (9.03)	0.273*** (8.77)	0.242*** (5.78)	0.059*** (2.45)	0.034 (1.32)	0.043 (1.37)
<i>Unemployment</i>	0.033 (0.65)	0.030 (0.60)	0.042 (0.66)	0.048 (1.18)	0.045 (1.11)	0.064 (1.19)
<i>Corruption</i>	0.971*** (2.64)	0.915*** (2.56)	1.269*** (3.53)	0.954*** (5.10)	0.867*** (4.38)	1.056*** (4.04)
<i>Inflation</i>	-0.017 (-1.50)	-0.017 (-1.48)	-0.008 (-0.55)	-0.027 (-1.87)	-0.026 (-1.84)	-0.015 (-1.04)
<i>Density</i>		-0.001*** (-2.89)	-0.001*** (-2.24)		-0.001*** (-3.39)	-0.001*** (-2.94)
<i>Interestrates</i>			-0.026*** (-3.93)			-0.028*** (-3.29)
No. of obs.	1170	1170	896	924	924	707
No. of countries	129	129	110	127	127	106
R-squared (within)	0.15	0.15	0.22	0.17	0.18	0.26

Notes: The dependent variable is *G*. *T*-statistics (calculated with White standard errors) are in parenthesis. *** (**) indicate significance at the 1% (5%) level. Coefficients on country and time-fixed effects are not reported.

Table 4. The effect of greenfield FDI and M&As on government size: *System GMM results*

	(1)	(2)
<i>Lagged G</i>	0.941*** (3.63)	0.542*** (2.82)
<i>Greenfield</i>	0.071*** (2.73)	
<i>M&A</i>		-0.079 (-1.16)
<i>Growth</i>	-0.015 (-0.25)	-0.049 (-0.41)
<i>Dependency</i>	0.006 (0.30)	0.037** (1.99)
<i>Urbanisation</i>	0.007 (0.93)	0.010 (0.96)
<i>Unemployment</i>	-0.001 (-0.01)	0.153** (2.38)
<i>Corruption</i>	0.252 (0.35)	1.372** (2.27)
No. of obs.	1049	842
No. of countries	129	127
No. of instruments	28	28
AR1 (<i>p</i> value)	0.00	0.00
AR2 (<i>p</i> value)	0.12	0.47
Hansen test (<i>p</i> value)	0.32	0.48

Notes: The dependent variable is *G*. *T*-statistics are in parentheses. *** (**) indicate significance at the 1% (5%) level.

Table 5. The effects of greenfield FDI and M&As on government size: *Sub-sample results*

	Developed countries				Developing countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Greenfield</i>	0.073*** (2.62)	0.090*** (2.48)			0.023** (2.27)	0.026** (2.28)		
<i>M&A</i>			0.005 (0.59)	0.003 (0.23)			-0.017 (-1.57)	-0.015 (-1.19)
<i>Growth</i>		-0.060*** (-2.34)		-0.046 (-1.66)		-0.006 (-0.19)		0.015 (0.45)
<i>Dependency</i>		0.285*** (4.39)		0.273*** (4.32)		0.033 (1.06)		0.022 (0.85)
<i>Urbanisation</i>		-0.184 (-1.70)		-0.172 (-1.50)		0.436*** (7.61)		0.096 (1.60)
<i>Unemployment</i>		0.025 (0.68)		0.031 (0.92)		0.025 (0.40)		0.069 (1.14)
<i>Corruption</i>		1.674*** (4.44)		1.708*** (3.59)		0.924 (1.83)		0.941*** (4.22)
No. of obs.	361	361	349	349	818	809	579	575
No. of countries	37	37	37	37	93	92	91	90
R-squared (within)	0.28	0.35	0.25	0.31	0.09	0.14	0.12	0.14

Notes: The dependent variable is *G*. *T*-statistics (calculated with White standard errors) are in parenthesis. *** (**) indicate significance at the 1% (5%) level. Coefficients on country and time fixed-effects are not reported.

Table A1. List of countries and their classification

Algeria	1	Dominican Republic	1	Lao PDR	1	Qatar	1
Angola	1	Ecuador	1	Latvia	2	Romania	2
Argentina	1	Egypt, Arab Rep.	1	Lebanon	1	Rwanda	1
Aruba	1	El Salvador	1	Libya	1	Saudi Arabia	1
Australia	2	Eritrea	1	Lithuania	2	Senegal	1
Austria	2	Estonia	2	Luxembourg	2	Seychelles	1
Bahamas, The	1	Ethiopia	1	Macao SAR, China	1	Sierra Leone	1
Bahrain	1	Fiji	1	Madagascar	1	Singapore	1
Bangladesh	1	Finland	2	Malawi	1	Slovak Republic	2
Barbados	1	France	2	Malaysia	1	Slovenia	2
Belgium	2	Germany	2	Malta	2	Solomon Islands	1
Bermuda	2	Ghana	1	Mauritania	1	South Africa	1
Belize	1	Greece	2	Mauritius	1	Spain	2
Bolivia	1	Guatemala	1	Mexico	1	Sri Lanka	1
Botswana	1	Guinea	1	Mongolia	1	Sudan	1
Brazil	1	Guyana	1	Morocco	1	Sweden	2
Brunei Darussalam	1	Haiti	1	Mozambique	1	Switzerland	2
Bulgaria	2	Honduras	1	Myanmar	1	Syria	1
Burkina Faso	1	Hong Kong	1	Namibia	1	Tanzania	1
Cambodia	1	Hungry	2	Nepal	1	Thailand	1
Cameroon	1	Iceland	2	Netherlands	2	Trinidad & Tobago	1
Canada	2	India	1	New Zealand	2	Tunisia	1
Cayman Islands	1	Indonesia	1	Nicaragua	1	Turkey	1
Chile	1	Iran, Islamic Rep.	1	Nigeria	1	Uganda	1
China	1	Iraq	1	Norway	2	United Arab Emirates	1
Colombia	1	Ireland	2	Oman	1	United Kingdom	2
Congo, Dem. Rep.	1	Israel	2	Pakistan	1	United States	2
Congo, Rep.	1	Italy	2	Panama	1	Uruguay	1
Costa Rica	1	Jamaica	1	Papua New Guinea	1	Venezuela, RB	1
Côte d'Ivoire	1	Japan	2	Paraguay	1	Vietnam	1
Croatia	2	Jordan	1	Peru	1	Yemen, Rep.	1
Cyprus	2	Kenya	1	Philippines	1	Zambia	1
Czech Republic	2	Korea, Rep.	1	Poland	2	Zimbabwe	1
Denmark	2	Kuwait	1	Portugal	2		

Note: The number “1” [“2”] indicates that the country was included in the subsample of 97 [38] developing [developed] countries (according to UNCTAD classification).

Table A2. Summary statistics of the main variables used in the analysis of the effects of total FDI, greenfield FDI, and M&As on government size

	Observations	Mean	Min.	Max.	Std.Dev.
<i>FDItotal</i>	1322	4.985	-55.066	76.327	7.022
<i>GFI</i>	1257	6.114	0.008	106.287	10.265
<i>MA</i>	980	1.433	-19.184	135.547	6.623
<i>G</i>	1235	15.467	2.047	46.601	5.452
<i>Dependency</i>	1330	59.432	16.542	108.114	18.057
<i>Urbanisation</i>	1350	59.696	11.606	100.000	24.037
<i>Corruption</i>	1349	0.124	-1.816	2.553	1.055