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KIEL WORKING PAPER

**Greenfield FDI,
Cross-Border M&As and
Government Size**

A photograph showing a person's hands working at a desk. The person is using a pen to write on a piece of paper. There are several yellow sticky notes scattered around the desk. A white marker is also visible. The background is slightly blurred, showing a person's arm and hand resting on the desk.

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ABSTRACT

GREENFIELD FDI, CROSS-BORDER M&As AND GOVERNMENT SIZE

Ayesha Ashraf, Dierk Herzer, and Peter Nunnenkamp

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 130 countries for the period from 2003-2011, 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, mergers & acquisitions, economic insecurity, 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. Economic insecurity is supposed to be higher in open economies with “greater exposure to the risks emanating from turbulence in world markets” (Rodrik 1998: 1011; see also Garrett, 1998). Rodrik (1998) argues that increased external risk due to international trade and capital flows is associated with greater volatility in domestic income and consumption. According to Osberg (2015: 5), individuals feel economically insecure when they perceive a significant downside economic risk – i.e., a hazard or danger – looming in their economic future.” Labour markets represent a major transmission channel through which external risk translates into domestic economic insecurity with regard to wages and employment.

Against this backdrop, the so-called *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. However, the increasing demand for government spending predicted by the compensation hypothesis “could not be easily matched by an increasing supply” (Liberati, 2007: 216). Rather, government spending is widely expected to shrink due to higher mobility of production factors. In particular, the compensation hypothesis may not hold since internationally mobile capital avoids locations where increasing demand for government spending threatens to result in rising private costs of production.¹

In testing the empirical validity of the compensation hypothesis, 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 Pandey, 2012; Down, 2007; Dreher et al., 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 Gemmell et al. (2008) have examined the effect of inward FDI on government size. They find that FDI has no effect on government size, though FDI significantly shifts the expenditure composition towards social spending. However, the estimations of Gemmell et al. (2008) are based on a small sample of 15 member countries of the Organisation for Economic Cooperation and Development (OECD). Moreover, they employ aggregate

¹ In other words, the counterhypothesis to the compensation hypothesis, often referred to as the *efficiency hypothesis*, predicts that international capital mobility constrains governments to provide social insurance against greater economic insecurity (Garrett and Mitchell, 2001).

inward FDI even though different types of FDI can be expected to have varying effects on government size and the composition of expenditure.

In this paper, we contribute to overcoming these limitations. In particular, we decompose total FDI inflows into greenfield FDI and cross-border mergers and acquisitions (M&As).² We hypothesize that greenfield FDI generates domestic economic insecurity, in terms of wage and employment-related risk, to a greater degree than M&As. Consequently, we expect greenfield FDI to lead to greater demand for more government spending, particularly for expenditure items that may offer compensation for increased insecurity, than M&As do. It is mainly for two reasons why we suppose these two types of FDI to have different effects on economic insecurity and the demand for government spending (see Section 2 for details). First, greenfield FDI is more volatile than FDI inflows in the form of M&As. Second, greenfield FDI is often motivated by international cost differences. Specifically, the relocation of labour intensive stages of production to lower income host countries tends to take the form of greenfield FDI, rather than M&As.³ By contrast, M&As dominate the FDI relations between similarly advanced countries with relatively high per-capita income.⁴ Against this backdrop, we expect greenfield FDI to be associated with higher economic insecurity and increased demand for government spending, compared to M&As.

Examining separate effects of greenfield FDI and M&As on government spending and the composition of public expenditure represents a major first step to account for the heterogeneity of inward FDI. Surprisingly, this is unexplored territory even though the combination of both modes of entry into a single measure of total FDI may give rise to ambiguous results when testing the empirical validity of the compensation hypothesis. Clearly, there are additional aspects of FDI heterogeneity that may matter—but measurement problems and insufficient data render it almost impossible to capture

² By definition, greenfield FDI is new investment that brings additional production capacity, whereas M&As involve a change of existing assets and production capacity from local to foreign hands.

³ Importantly, cost-oriented FDI must not be equated with vertical FDI, i.e., the offshoring of specific stages of the production process. As shown by Alfaro and Charlton (2009), vertical FDI also includes overseas production of highly specialized inputs in high-cost locations. We are grateful to two anonymous reviewers for having alerted us to this point.

⁴ According to Nocke and Yeaple (2008: 529), “most FDI takes the form of cross-border acquisitions when production-cost differences between countries are small, while greenfield investment plays a more important role for FDI from high-cost into low-cost countries.” At the same time, the findings of Alfaro and Charlton (2009) imply that FDI relations between similarly advanced countries could be horizontal, i.e., mainly market-seeking, as well as vertical, i.e., making use of intra-industry specialization in the production of skill intensive inputs.

them in empirical analyses.⁵ For instance, the distinction between horizontal and vertical FDI figures prominently in theoretical models, while the data situation hardly allows for a clear-cut classification of observed FDI flows along these lines.⁶ Nevertheless, we address this issue at least tentatively. Our large sample of up to 130 host countries, covering the period from 2003 to 2011, allows us to perform separate estimations for two sub-samples, namely developed and developing host countries. While M&As were the dominant type of FDI in developed countries (57 percent of total FDI inflows), greenfield FDI accounted for 88 percent of total FDI flows to developing countries in 2003-2011. Drawing on Nocke and Yeaple (2008) in combination with Alfaro and Charlton (2009), estimating the effects of greenfield FDI in developing host countries comes close to identifying the effects of cost-oriented vertical FDI.⁷

Finally, we address another important limitation in most of the existing studies on the effects of economic openness on government size; typically, it is implicitly assumed that openness increases economic insecurity without testing this transmission mechanism (e.g., Benarroch and Pandey, 2012; Gemmell et al., 2008, among others). The present study is the first that explicitly addresses this transmission mechanism, by examining the effects of the two modes of entry of FDI on labour market volatility and, thereby, on economic insecurity in a first step.⁸

We find 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

⁵ Fillat and Woerz (2011) account for the heterogeneity among industries and host countries in their assessment of the effects of FDI on productivity growth. Gattai (2010) addresses another aspect of heterogeneity by distinguishing joint ventures and wholly owned subsidiaries of Italian firms in Asia; she finds that full ownership is preferred by firms with stronger intangible assets. Chang and Van Marrewijk (2013) assess whether the extent of foreign ownership is important for the productivity premium of foreign firms; they find that the higher productivity of firms with foreign ownership of 90% and more, compared to firms with lower shares of foreign ownership, is based on higher capital intensity only.

⁶ Note that the findings of Alfaro and Charlton (2009) are based on unpublished firm-level data for just one year (2005). Huang et al. (2013) examine the potentially different productivity effects of vertical FDI by Taiwanese parent firms in developing countries and horizontal FDI in developed countries.

⁷ Using the terminology of Alfaro and Charlton (2009), this captures the inter-industry type of vertical FDI at least tentatively, rather than the intra-industry type of vertical FDI that figures more prominently in developed host countries.

⁸ In a similar vein, Forte (2016) argues that the previous literature typically does not take into account the mode of entry of FDI even though it is likely to affect the level of competition and, thus, economic insecurity in the host country. Taking a different perspective, Chakrabarti et al. (2016) focus on M&As in vertically related industries and the role of local competition in creating incentives to engage in such M&As.

total sample of host 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, our analysis supports the compensation hypothesis, though only for this type of FDI.

The rest of the paper is organised as follows: In Section 2, we review the relevant literature and derive our hypothesis that greenfield FDI increases labour market volatility, economic insecurity and government size more strongly than M&As. Section 3 informs about our empirical models and the data used. Section 4 presents the empirical analysis, while Section 5 concludes.

2. Theoretical Background and Related Literature

Rodrik (1997, 1998) and Garrett (1998) argue that international economic integration is associated with growing economic insecurity and greater demand for compensating government expenditures. Based on this reasoning, we hypothesize that countries that are more open to FDI inflows face greater economic insecurity than less open host countries. According to the compensation hypothesis, it would follow that openness to FDI leads to higher government expenditures. Specifically, we hypothesize that the effects of greenfield FDI on economic insecurity and government size differ from the effects of M&As. More precisely, we expect stronger effects of greenfield FDI on economic insecurity and the demand for government expenditures. In this section, we discuss the plausibility of our hypotheses by drawing on the relevant literature and some related empirical findings.

While FDI is widely assumed to be less volatile than other private capital flows, Lensink and Morrissey (2006) argue that sudden changes in the volume of FDI inflows have a destabilizing impact on the domestic economy. Indeed, Lensink and Morrissey find that volatile FDI negatively affects economic growth in the host country. What is more, FDI may lead to more volatile labour markets in the host countries by increasing the wage elasticity of labour demand, i.e., the responsiveness of wages and employment to a given labour demand shock (Rodrik, 1997; Scheve and Slaughter, 2004).⁹ Clearly, the international sector of host economies will be exposed to FDI-induced labour market volatility and economic insecurity in the first place. For instance, the employment opportunities and

⁹ This has been attributed to an FDI-induced increase in competition in product markets and greater substitutability of host-country workers in multinational firms (Fabbri et al., 2003; Scheve and Slaughter, 2004).

wages of workers in world market-oriented industries are most likely to be affected if FDI enters these industries and crowds out local investment and production.¹⁰ However, workers in local firms producing for the domestic market tend to be affected at least indirectly, either because local market-seeking FDI has crowding-out effects or because world market-oriented FDI draws mainly on foreign inputs.¹¹

For several reasons, we expect greenfield FDI to have stronger effects on economic insecurity in the host countries than M&As. First of all, greenfield FDI appears to be more volatile than M&As. Burger and Ianchovichina (2014) 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 FDI. Similarly, a surge (stop) is *M&A-led* when more than half of the increase (or decrease) in FDI can be attributed to an increase (or decrease) in M&A activity. The analysis of Burger and Ianchovichina (2014) shows that greenfield-led surges and stops occur more frequently than M&As-led events.¹² The data on the two modes of entry we use for our estimations below corroborate that the volume of greenfield FDI is more volatile than the volume of M&A inflows. The standard deviation of greenfield FDI (as a percentage of GDP) is 10.71, while the standard deviation of M&As (as a percentage of GDP) is 5.04.

Second, greenfield FDI is expected to increase economic insecurity in the host country by adding more strongly to competitive pressure in local product markets than M&As (UNCTAD, 2000; Forte, 2016). Greenfield FDI creates new assets and adds to local production capacity. In contrast, M&As transfer existing assets and production capacity from local into foreign hands so that competitive pressure may remain unchanged.¹³ Modelling the relationships between the two modes

¹⁰ We are grateful to an anonymous reviewer for having alerted us to this point.

¹¹ In contrast, public sector workers are hardly exposed to FDI-induced insecurity unless the macroeconomy of the host country is seriously affected. As explained in greater detail below, our indicators of economic insecurity cannot capture sector-specific labour market effects. In particular, we cannot isolate the international sector that is directly exposed to FDI. This implies that we tend to err on the conservative side of finding insignificant results if FDI effects were restricted to a relatively small international sector, while purely local firms and the public sector were unaffected.

¹² The unconditional probability of experiencing a surge in greenfield FDI and M&As was 11.7% and 3.2%, respectively; the unconditional probability of experiencing a greenfield-led stop was 12.8%, compared to 3.3% for M&As.

¹³ According to Harms and Méon (2011), a larger share of M&A sales merely represents a rent that accrues to incumbent owners.

of entry, technology transfers and market structure, Mattoo et al. (2004) argue that the competitive enhancing effect of greenfield FDI is clearly greater than that of M&As.

Third, some empirical studies tend to support the view that it is mainly greenfield FDI that adds to economic insecurity by fiercer competitive pressure in the host countries. Using data on Norwegian firms, Balsvik and Haller (2010) find that greenfield FDI has a negative impact on the productivity of domestic plants, both in the same industry and in the same labour market region.¹⁴ Ashraf and Herzer (2014) examine the effects of greenfield FDI and M&As on domestic investment in developing countries. Their results indicate that greenfield FDI crowds out domestic investment, while M&As do not have a significant effect on domestic investment.

Taken together, this invites our first hypothesis:

H1: FDI-induced economic insecurity in the host country depends on the mode of entry. Greenfield FDI has stronger effects on economic insecurity than M&As.

As noted above, the reasoning of Rodrik (1997, 1998) and Garrett (1998) implies that FDI-induced labour market volatility and economic insecurity would lead to greater demand for government expenditures. Accordingly, greater economic insecurity resulting from increased volatility of employment and wages generates demand for larger governments as a form of insurance that compensates workers for the exposure to higher risks. The exposure to risk in the labour market is regarded as a powerful determinant of people's preferences for state protection and public risk sharing (Iversen and Cusack, 2000; Rodrik, 1998). Obviously, the demand for government spending should be concentrated on public expenditure items that are best suited to provide compensation and protection. It is thus mainly government spending for social security that can be expected to increase with greater economic insecurity. However, demand effects on government spending for social security would carry over to total government expenditures, unless the overall size of governments is

¹⁴ This is in sharp contrast to the positive productivity effects of M&As which Balsvik and Haller (2010) find for domestic plants in the same industry. Using a large sample of 123 developed and developing countries, Ashraf et al. (2016) show that M&As increase total factor productivity in developed countries. However, greenfield FDI does not have any effect on total factor productivity in developed or developing countries.

constrained by cost considerations and investor reactions (as the above mentioned efficiency hypothesis would suggest).¹⁵

The available theoretical and empirical literature offers little guidance on whether specific modes of FDI entry would have stronger effects on government size than other modes. Nevertheless, major characteristics that are widely associated with greenfield FDI suggest that mainly this mode of entry fuels the demand for compensating government expenditures. In addition to the above noted characteristics leading to our first hypothesis, the predominant motives underlying greenfield FDI and M&As are likely to play an important role for the demand for government expenditures. It appears to be of particular relevance in this context that greenfield FDI is often motivated by international cost differences. The survey conducted by Wes and Lankes (2001) reveals that production costs are of much greater importance for greenfield investors in transition countries than for investors entering through M&As. What is more, cost considerations are widely perceived to be the driving force of the offshoring of labour intensive stages of production to lower income host countries through greenfield FDI. For instance, Nocke and Yeaple (2008: 529) argue that “greenfield investment plays a more important role for FDI from high-cost into low-cost countries;” in contrast, “most FDI takes the form of cross-border acquisitions when production-cost differences between countries are small.”¹⁶

The cost orientation of greenfield FDI implies that the wage elasticity of labour demand tends to be higher for this mode of entry than for the alternative mode of entry through M&As. Surprisingly, there are no empirical studies comparing the labour demand elasticities between firms that engage in greenfield FDI or M&As. However, it seems reasonable to assume stronger substitution effects in response to a given shock to labour demand when cost considerations figure prominently. Greenfield FDI would then lead to greater demand for compensating government expenditures by increasing the risk of local workers of being replaced, either because greenfield investors increasingly rely on foreign inputs or prove to be ‘footloose’ in the sense of relocating production to where wages stay relatively

¹⁵ As discussed in more detail below, sufficient data on specific expenditure items such as government spending on social security are only available for fairly small samples. Hence, we use rather broadly defined measures of government size in our baseline estimations. Arguably, this provides a particularly strict test of the compensation hypothesis. Finding a positive effect of FDI on broader measures of government expenditure would imply that higher social security payments are not offset by cuts in other expenditure items.

¹⁶ It should be recalled from the Introduction that cost-oriented greenfield FDI in lower income host countries represents just part of vertical FDI. As stressed by Alfaro and Charlton (2009), FDI in advanced host countries (which mainly takes the form of M&As) represents another part of vertical FDI even though cost considerations do not play a major role for this type of (intra-industry) vertical FDI.

low.¹⁷ Moreover, labour demand shocks tend to occur more often if cost-oriented greenfield FDI represents the dominant mode of entry, since international wage differentials change more frequently than the persistent determinants of other types of FDI (e.g., market size, local endowments and specialization profiles). Taken together, greenfield FDI is more likely than M&As to fuel the demand for compensating government expenditures by exposing local workers to higher labour market volatility.

At the same time, the cost orientation of greenfield FDI may constrain government spending in the host country. Specifically, the higher wage elasticity of labour demand could render it more difficult for host-country governments to meet the increased demand for social protection by increased public spending. As noted earlier, the compensation hypothesis may not hold if increased demand for government spending threatens to result in rising private costs of production, and if greenfield investors are particularly responsive to higher private costs. Nevertheless, for political economy reasons, it appears unlikely that governments could completely ignore increasing public demand for social protection, or that governments would be able to fully offset increased public social security spending by cutting other expenditure items accordingly.¹⁸ This applies especially to democratic governments vying for re-election and, thus, being dependent on local constituencies. More realistically perhaps, the composition of government spending is likely to shift towards compensating social protection. Regrettably, the data situation allows us to test this more specific hypothesis only tentatively for a substantially reduced sample.¹⁹ Focusing on government size more broadly defined for a large sample of developing and developed countries, our second hypothesis reads:

H2: The effects of FDI on government size in the host country depend on the mode of entry. Greenfield FDI has stronger effects on the size (and composition) of government expenditure than M&As.

¹⁷ Greenfield FDI typically relies more heavily on imported inputs, while M&As are more closely associated with local suppliers (e.g., Wes and Lankes, 2001). This difference matters for the labour demand elasticities of the two types of FDI, considering the finding of Görg et al. (2009) that the labour demand of foreign firms becomes less elastic with respect to wages if foreign firms have stronger backward linkages with the local economy. See Görg and Strobl (2003) on 'footlose' foreign investors locating abroad only those production processes which are easily transferable between countries.

¹⁸ Note also that social security systems, notably in relatively advanced host countries, often have built-in mechanisms ensuring that social security spending increases automatically with higher labour market volatility. Inertia and longer-term budgeting tend to work against fully offsetting cuts of other expenditure items.

¹⁹ See Section 4 for details.

3. Empirical Models and Data

Models

As a first and preliminary step, we examine the effects of greenfield FDI and M&As on labour market volatility by estimating a model of the 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. Following common practice (e.g. Buch and Schlotter, 2013; Buch and Pierdzioch, 2014), we use the volatility of employment as our measure of labour market volatility, labelled *Empvol*. In supplemental tests, we also use alternative measures of labour market volatility such as the volatility of the unemployment rate, *Unempvol*, and the volatility of labour income per worker, *Labincomevol*.²⁰

FDI represents the two different modes of entry of FDI. The first variable is greenfield investment, *GFI*, 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 between the two different modes of entry, estimations for *GFI* and *M&A* are performed separately, as suggested by Calderón et al. (2004).

X is the usual vector of m time-varying control variables. In our baseline specification, we control for the volatility of output, *GDPvol*, trade openness (the sum of imports plus exports as a percentage of GDP), *Trade*, regulatory quality, *Govern*, and recessions, *Recession*.

As a robustness check, we extend the vector of control variables in equation (1) to include a measure of labour market flexibility, *Labfree*, FDI volatility, *FDIvol*, and the inflation rate, *Inflation*.

Following common practice in panel data analysis, fixed effects, μ_i , are included to control for any country-specific omitted factors are relatively stable over time. The fixed effects not only capture unobserved time-invariant factors such as geography and culture, but also all country-specific labour

²⁰ Because data on wages are not available for many countries, we are unable to use wage volatility as an additional measure of labour market volatility.

market characteristics (including labour laws and regulations) that do not change over the sample period.²¹ Also included are period dummies, λ_t , to control for unobserved common time-specific factors such as global business cycles.

The second step and main focus is to examine the effects of greenfield FDI and M&As on government size. We therefore estimate a model of the following form:

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

where i and t are, as before, country and time indices, and $GGFCE$ represents government size. Following the literature on trade openness and government size (e.g. Alesina and Wacziarg, 1998; Rodrik, 1998; Ram, 2009; Epifani and Gancia, 2009), we use general government consumption expenditure as a percentage of GDP as our measure of government size. In additional tests, we also consider ten categories of disaggregated government expenditure, including social protection.

In equation (2), FDI represents total FDI, FDI_{total} , GFI , and $M\&A$ (all expressed as a percentage of GDP). As mentioned before, separate estimations for greenfield FDI and M&As are performed to avoid multicollinearity.

The vector X consists of the most commonly used control variables in the literature on openness and government size. These variables are the age-dependency ratio (the 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*.

²¹ Panel estimation makes it possible to account for unobserved country-specific effects, thus eliminating a possible source of omitted-variable bias. In the fixed-effects model, these effects are controlled for by including country dummies. The alternative is the random-effects approach, which instead estimates the variance of the residuals and uses this estimate to adjust the regression coefficients (and their standard errors). The crucial difference between the fixed- and random-effects approaches is that the latter assumes that the omitted country effects are random and uncorrelated with the regressors. This assumption is very strong, and the standard Hausman (1978) test rejects the random-effects model in favour of the fixed-effects model for our empirical specifications. Hence, we prefer the fixed-effects approach. We present the results of this test for our core specifications in the last row of Table A3 in the Appendix. This table also reports the parameter estimates from the random-effects model. These estimates do not differ qualitatively from those reported in Tables 1 and 4.

In the robustness checks, we include as additional control variables a measure of democracy, *Democracy*, the inflation rate, *Inflation*, population density (population divided by area), *Density*, and the domestic lending interest rate, *Interestrates*.

As in equation (1), fixed effects, μ_i , and period dummies, λ_t , are included. Given that the fixed effects control for all relatively time constant country characteristics that affect government size, they also capture the effects of the electoral system (majoritarian versus proportional) and the political system (presidential versus parliamentary).²²

To estimate the models, we use a pooled ordinary least square (OLS) estimator with Driscoll and Kraay (1998) standard errors. The Driscoll and Kraay estimator relies on a non-parametric covariance matrix that produces heteroskedasticity and autocorrelation consistent standard errors that are robust to general forms of spatial and temporal dependence. Thus, the estimator corrects for serial correlation (of unknown length) both within and between cross-sectional units. The latter is of particular advantage for the present application because it is well known since the work of Blonigen et al. (2007) that FDI is spatially autocorrelated.²³ Although the Driscoll and Kraay (1998) method relies on large T -asymptotics, it has been shown to perform reasonably well in large N , small T panels (like ours), compared with alternative covariance estimators when cross-sectional dependence is present (Hoechle, 2007).

As an alternative to the pooled OLS estimator, we employ the Blundell and Bond (1998) system GMM estimator to account for the potential endogeneity of greenfield FDI and M&As. The basic idea of the system GMM estimator is to estimate the empirical model as a two-equation system. One equation is in first differences, which removes the fixed effects, and the second equation is in levels, which brings in the technical gains of additional level moment conditions and increased efficiency (e.g. Hong and Sun, 2011). More specifically, the system GMM estimator combines the standard set of

²² Persson and Tabellini (2004) find, using cross-sectional data, that presidential regimes induce smaller governments than parliamentary democracies, while majoritarian elections lead to smaller governments than proportional elections.

²³ We conducted several specification tests for our models and found evidence of heteroscedasticity and autocorrelation (at least in some specifications). Unfortunately, it is not possible to test for cross-sectional (or spatial) dependence in the residuals in highly unbalanced panels (like ours). However, given that there is evidence to suggest that FDI data are spatially correlated (as discussed above), we correct the standard errors for heteroscedasticity, autocorrelation and spatial correlation using Driscoll and Kraay's (1998) extension of Newey and West's non-parametric variance-covariance estimator.

equations in first differences with suitable lagged levels as instruments, with an additional set of equations in levels with suitable lagged first differences as instruments.

Data

We now describe the data used to estimate equations (1) and (2). Our main measure of labour market volatility is employment volatility. This variable is constructed as the first difference of the log of employment (the growth rate of employment in decimal form), calculated using a rolling window of five years. The data on employment (the number of persons employed) are from the Penn World Table (PWT), version 8.1 (Feenstra et al., 2015).²⁴ As a second measure of labour market volatility, we use the five-year moving standard deviation of the change in the unemployment rate (expressed in percentage points). Data on the unemployment rate are obtained from the World Development Indicators (WDI) 2015 online database.²⁵ Finally, our third measure is labour income volatility, measured as the five-year moving standard deviation of the first difference of the log of labour income per worker (the growth rate of labour income per worker in decimal form). Labour income per worker is constructed with data from the PWT8.1, by multiplying the share of labour income in GDP by real GDP and dividing by the number of persons employed.

As our measure of government size we use general government final consumption expenditure as a percentage of GDP from the WDI. General government final consumption expenditure can be divided into the following components (Eurostat, 2011): general public services; defence; education; health; public order and safety; economic affairs; environment protection; housing and community amenities; recreation, culture and religion; and social protection.²⁶ Given that data on these disaggregated categories are not available in the WDI dataset, we use data from the Eurostat 2015 online database to also examine the effects of greenfield FDI and M&As on disaggregated government expenditures (expressed as a percentage of GDP).²⁷ It should be noted that disaggregated government

²⁴ Available at: <http://www.rug.nl/research/ggdc/data/pwt/pwt-8.1>.

²⁵ Available at: <http://data.worldbank.org/data-catalog/world-development-indicators>.

²⁶ Social protection expenditure includes nine categories (Eurostat, 2011): sickness and disability, old age, survivors, family and children, unemployment, housing, social exclusion not elsewhere classified, R&D social protection, and social protection not elsewhere classified.

²⁷ Available at: https://stats.oecd.org/Index.aspx?DataSetCode=SNA_TABLE11.

expenditure data are publicly available for only a limited number of countries. The results of the disaggregated analysis should therefore be viewed with some caution.

Data on total FDI, greenfield FDI, and cross-border M&As are from the United Nations Conference on Trade and Development (UNCTAD) database.²⁸ The data on total FDI 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. UNCTAD's cross-border M&A sales data refer to the net sales by the 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. Finally, 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 as FDI flows. We use (nominal) GDP data from the WDI to express all our FDI variables as a percentage of GDP.

FDI volatility is constructed as the standard deviation of the change in the percentage share of total FDI in GDP using a five-year rolling window. As our measure of output volatility, we use the standard deviation of the first difference of the log of real GDP per capita (the growth rate of real GDP per capita in decimal form) from the PWT8.1, again calculated over five-year intervals.

The data used to calculate the growth rate of real GDP (in percentage points) and to construct our recession variable are also from the PWT8.1. The recession variable is a crisis dummy that takes a value of one if there is a crisis (and zero otherwise). For each country, crises are identified when the logarithm of real GDP deviates by more than one standard deviation from its trend level (computed using the Hodrick–Prescott filter with a smoothing parameter of 100).

Regulatory quality is measured by the Kaufmann-Kraay-Mastruzzi index of regulatory quality; control of corruption is measured by the Kaufmann-Kraay-Mastruzzi corruption indicator; and our measure of democracy is the Kaufmann-Kraay-Mastruzzi measure of voice and accountability.

²⁸ Available at: <http://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx>.

Kaufmann et al. (2010) define these indicators as follows: Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development; control of corruption captures 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; and voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Data on these variables are obtained from the Worldwide Governance Indicators project.²⁹

The Heritage Foundation index of labour freedom is used as a specific measure of labour market flexibility.³⁰ This index measures labour freedom by evaluating six quantitative factors, including the ratio of the minimum wage to the average value added per worker, hindrance to hiring additional workers, rigidity of hours, difficulty of firing redundant employees, legally mandated notice period, and mandatory severance pay (Miller and Kim, 2015).

The data on trade openness, inflation (measured using the GDP deflator), the age-dependency ratio, the urbanisation rate, population density, and the domestic lending interest rate are all from the WDI.

Merging these different data sources produces a dataset of up to 1127 observations from 2003 to 2011 for up to 130 countries.³¹ A list of the countries included in the (total) sample is provided in Table A1 in the Appendix. Table A2 in the Appendix presents some summary statistics on the variables included in our baseline specifications.

It should be noted that the number of observations varies across the models being estimated, depending on the availability of data for the dependent and explanatory variables. More specifically, there are more data on greenfield FDI than on M&As, implying that when all available data are used, the regressions for greenfield FDI and M&As are based on different samples. We thus need to ensure that potential differences in the effects of greenfield FDI and M&As on labour market volatility and

²⁹ Available at: <http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=worldwide-governance-indicators>.

³⁰ The data are available at <http://www.heritage.org/index/explore>.

³¹ Given that the UNCTAD data on greenfield FDI and cross-border M&A sales are first available for 2003, while the PWT8.1 data end in 2011, the empirical analysis covers the period from 2003 to 2011.

government size are not due to different samples. We do this by not only estimating our baseline specifications for the full sample (with all available data), but also for a common sub-sample of 350 observations and 108 countries.³²

4. 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 is to determine whether the two different modes of entry of FDI generate different demands for government expenditure by affecting economic insecurity differently. Therefore, as a first and preliminary step, we examine the effects of greenfield FDI and M&As on labour market volatility. Subsequently, we present a detailed analysis of the effects of total FDI inflows, greenfield FDI, and M&As on government size.

The Effects of Greenfield FDI and M&As on Economic Insecurity

Baseline results: Table 1 presents the regression results of the baseline model of the effects of greenfield FDI and M&As on labour market volatility for the full sample (Panel A) and the common sample (Panel B), with and without control variables. As can be seen, the coefficient on greenfield FDI is positive and significant across all specifications and samples, whereas the coefficient on M&As is always 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 expectations. As in previous studies (e.g. 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. In addition, the dummy variable for recessions enters significantly positive. Trade openness is also found to be positively and significantly related to employment volatility. This supports the view that international trade in final goods increases labour market volatility by increasing the elasticity of labour demand, or by increasing

³² If we used a constant sample size for all regressions, our sample size would decrease to 48 observations for 16 countries. This sample would be too small to draw statistically valid conclusions.

shocks to labour demand (e.g., Rodrik, 1998; Scheve and Slaughter, 2004). Further, the coefficient on *Govern* suggests that by providing favourable conditions to potential investors, good governance reduces labour market volatility.

[Table 1]

In order to evaluate the economic significance of our results, we standardise the estimated coefficients in column (b) by multiplying them by the ratio of the standard deviations of the independent and dependent variables.³³ The standardised (or beta) coefficients are reported in column (c). Although it is well known that such standardised coefficients are not meaningful for dummy variables, the standardised coefficient of the crisis dummy variable is reported for completeness, but not further discussed. The interpretation of the other coefficients in column (c) is as follows: a one-standard-deviation increase in greenfield FDI increases employment volatility by 6.691 percent of a standard deviation in that variable; a one-standard-deviation increase in GDP per capita volatility raises employment volatility by 20.130 percent of a standard deviation in employment volatility; an increase in trade openness by one standard deviation is associated with an increase in employment volatility by 67.924 percent of a standard deviation; and a one-standard-deviation increase in *Govern* reduces employment volatility by 72.660 percent of a standard deviation. We thus find that greenfield FDI has a statistically significant but economically small effect on employment volatility. The relatively small effect is not surprising, since greenfield FDI accounts for only a small fraction of GDP (about 6.5 percent on average in our sample).

Robustness: In Table 2, we check the robustness of our results to alternative dependent variables. The volatility of the unemployment rate is the dependent variable in columns (a) and (b), while the volatility of labour income is the dependent variable in columns (c) and (d). The results in columns (a) and (b) suggest that increases in greenfield FDI are associated with increases in unemployment volatility, while M&As are not significantly associated with unemployment volatility. The results in columns (c) and (d) show insignificant effects of both greenfield FDI and M&As on labour income

³³ The standard deviations of the variables are reported in summary statistics (Table A2 in the Appendix).

volatility. We thus find that greenfield FDI contributes to greater economic insecurity through inducing employment and unemployment volatility but not labour income volatility, whereas there is no evidence that M&As increase economic insecurity.

[Table 2]

In Table 3, we add additional control variables that may drive the *GFI*-uncertainty relationship: labour market flexibility, FDI volatility, and inflation. While it is obvious that local labour market conditions and inflation may affect both foreign investment decisions and labour market insecurity, it is perhaps less obvious why we also control for the volatility of FDI. The reason is that higher FDI volatility can lead to increased economic uncertainty (Lensink and Morrissey, 2006). At the same time, FDI volatility may discourage FDI to the extent that FDI volatility reflects political and economic instability. As dependent variables, we use employment volatility in columns (a) and (b) and unemployment volatility in columns (b) and (c). As can be seen, greenfield FDI remains significant even when additional control variables are included, regardless of which dependent variable is used, while M&As remain insignificant.

[Table 3]

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

Baseline results: Table 4 presents the baseline results for the effects of total FDI, greenfield FDI, and M&As on government size using the full sample (Panel A) and the common sample (Panel B). Again, we report results with and without control variables. The signs of the control variables are largely consistent with previous studies. As in the studies by Garrett and Mitchell (2001) and Dreher (2006), the sign of the coefficient on GDP growth is negative in Panel A. However, while Garrett and Mitchell (2001) and Dreher (2006) find that GDP growth is significantly negatively related to government size in OECD countries, the coefficient on *Growth* is statistically significant (and negative) only in column (b) of Panel A. In contrast, the GDP growth variable has a positive sign in Panel B, which is consistent with the results of Rudra (2002) for developing countries. As is the case in previous studies (e.g. Rodrik, 1998;

Shelton, 2007), the coefficient on the age-dependency ratio is positive and significant in all specifications presented in Panel A. However, the coefficient on *Dep* turns negative in Panel B. With regard to the urbanisation rate, similar to Avelino et al. (2005) and Ram (2009), the sign of the estimated coefficient is positive and statistically significant in all specifications presented in Table 4, except column (g) in Panel A. Consistent with the results of previous studies (e.g. Garrett and Mitchell, 2001; Rudra, 2002), the unemployment variable is positive in all regressions, but it is significant (at the 10% level) only in columns (b) and (g) of Panel A. Finally, the positive and highly significant coefficient on control of corruption suggests that lower levels of corruption are associated with larger government size. This finding is in line with the results of Mauro (1998).

Turning to the main variables of interest, the coefficient on total FDI is positive and significant in Panel A, but it is not significant in Panel B. The latter finding is consistent with the results of Gemmell et al. (2008). Comparing the results for the different modes of entry of FDI, the coefficient on greenfield FDI is always positive and significant, while the coefficient on M&As is always insignificant. This suggests M&As do not have any statistically significant effect on government size, whereas higher greenfield FDI leads to increased government size. The point estimate in column (d) of Panel A implies that each dollar of greenfield FDI increases government spending by approximately 2.4 cents. This effect is small but reasonable, given the small effect of greenfield FDI on economic uncertainty. However, it should be noted that static specifications such as those in Table 4 tend to capture short-run (one year) effects. Below, we also estimate dynamic models to examine the possibility of long-run effects on government size (over many years).

To assess the (relative) magnitude of all statistically significant effects, we again calculate the standardised coefficients. The results for the regression coefficients from column (d) of Panel A are reported in column (e). Accordingly, a one-standard-deviation increase in greenfield FDI results in an increase in government spending equal to 4.8 percent of a standard deviation in that variable; a one-standard-deviation increase in the age-dependency ratio increases the standard deviation of government spending by 25.3 percent; a one-standard-deviation increase in the urbanisation rate results in a 1.170 standard deviation increase in government size; and a one-standard-deviation increase in control of corruption increases government spending by almost one-fifth of a standard deviation. Expressed in relative terms, the estimated effect of greenfield FDI is about one-fifth that of

the dependency ratio, about one twenty-fifth that of the urbanisation rate, and about one-fourth that of control of corruption. Overall, the magnitudes are not implausible.

[Table 4]

Robustness: As a first robustness check of the finding that greenfield FDI increases government size while M&As do not have any statistically significant effect, the baseline model is augmented with three additional control variables commonly used in the literature on openness and government size (e.g. Alesina and Wacziarg, 1998; Dreher et al., 2008; Ram, 2009): inflation, (*Inflation*), the domestic lending interest rate (*Interestrates*), and population density (*Density*).³⁴ In addition, motivated by Persson and Tabellini's (2004) study of the effect of electoral rules and forms of government on the size (and composition) of government spending, we also control for (the quality of) democracy, *Democracy*.

The results of this exercise are presented in columns (a) and (b) of Table 5. The effects of the additional variables are largely as expected. The estimated coefficients on the lending interest rate and democracy are negative and significant in both columns; the coefficient on population density is negative in both specifications, but significant in only one; and the coefficient on inflation is negative but insignificant. Turning to the variables of major interest, the coefficient on greenfield FDI remains positive and significant while the coefficient on M&As is still insignificant. The results are thus consistent with those reported in Table 4.

[Table 5]

Next, we also include lags of greenfield FDI and M&As in our extended regressions to take account of the possibility that it may take some time for greenfield FDI and M&As to impact on government spending. As can be seen in columns (c) and (d) of Table 5, government size is positively affected by both current and lagged greenfield FDI, whereas the coefficient estimates on both current and lagged M&As are not significantly different from zero. It should be added that the significant

³⁴ Alesina and Wacziarg (1998) argue that population density should be controlled for since the costs of providing certain public goods increase less than proportionally to the size of the population, at least up to the point where congestion effects become more relevant.

coefficient on lagged *GFI* can be interpreted as an indication that greenfield FDI has a causal effect on government size; the causality problem is discussed in more detail below.

Finally, we simultaneously test the sensitivity of our results to the use of dynamic models and alternative estimation methods. More specifically, we estimate a dynamic panel model by including the lagged value of the dependent variable as an additional regressor in our baseline model. The inclusion of lagged government expenditures explicitly accounts for the dynamic process of changes in government size and also helps control for the effects of potentially relevant omitted variables and serial correlation in the disturbance term. Furthermore, the inclusion of the lagged dependent variable also allows us to examine whether changes in greenfield FDI and M&As result in long-run, persistent effects on government size.

A potential disadvantage of using a dynamic panel data model, however, is that the standard fixed-effects estimator may suffer from the so-called 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 toward zero when, as in the current dataset, the number of time periods is small. If the explanatory variables are correlated with the lagged dependent variable, the estimated coefficients of the explanatory variables may inherit this Nickell bias.

Another disadvantage of the standard fixed-effects estimator (with contemporaneous effects) is that it does not control for the simultaneity bias due to the potential endogeneity of FDI. 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 be an alternative explanation for the positive contemporaneous association between (greenfield) FDI and government size. On the other hand, 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, we use a standard test of strict exogeneity by adding leads of the FDI variables to the fixed effects regressions in columns (d) and (g) of panel A of Table 4 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 3.18 (with a *p*-value of 0.11) with one

lead, and 2.00 (with a p -value of 0.21) with two leads of greenfield FDI, suggesting that greenfield FDI is strictly exogenous. The F -statistics for M&As are 1.15 and 1.57 with one and two leads respectively, indicating that the null hypothesis of strict exogeneity cannot be rejected for M&As either (with p -values of 0.32 and 0.27). These results give us confidence that our analysis does not suffer from reverse causality problems.

Nevertheless, we additionally account for the potential endogeneity of greenfield FDI and M&As by applying the Blundell and Bond (1998) system GMM estimator to the dynamic specification of our baseline model.³⁵ The advantage of using the system GMM estimator is that it can overcome both the above-mentioned Nickel bias and potential endogeneity bias.

A potential drawback of the GMM estimator is that it may suffer from the well-known problem of too many instruments. A large number of instruments can overfit endogenous variables, failing to expunge their endogenous components and biasing coefficient estimates (Roodman, 2009). Unfortunately, there are no formal tests that can determine the number of lags that should be used as instruments. 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, we collapse the instrument set and use only the second lag of the variables as instruments.

The consistency of the system GMM estimator depends on both the validity of the instruments and the validity of the assumption that the differenced error term is free of second-order autocorrelation (by construction, the differenced error term is probably first-order serially correlated even if the original error term is not). We use the Hansen J test to test the exogeneity of the instrument set. The Arellano and Bond (1991) serial correlation test is used to test for second-order serial correlation in the first-differenced residuals (AR2).

Table 6 presents GMM estimates for different specifications of equation (2) to ensure the robustness of our results. Columns (a) and (b) report the results of the dynamic panel specification of our baseline model. Columns (c) and (d) report the results of a dynamic specification that also includes lagged values of all regressors (including the lagged dependent variable) to account for possible lagged

³⁵ 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 persistent.

effects. The estimates in columns (a) and (b) specify only *GFI* and *M&A* as endogenous, while in columns (c) and (d) all explanatory variables are treated as endogenous.

As can be seen, the specification tests show no signs of second-order serial correlation at the 5% level or invalid over-identifying restrictions. Furthermore, in all regressions, the number of instruments is less than the number of countries. We thus conclude that the estimated equations do not suffer from serious misspecification problems.

[Table 6]

The coefficient on the contemporaneous value of *GFI* is positive and statistically significant in both columns (a) and (c), while that on the lagged value in column (c) is insignificant. Thus, in contrast to the results in Table 5 (column (c)), the results in Table 6 (column (c)) indicate that greenfield FDI has only a contemporaneous effect on government size. More importantly, the coefficients on both contemporaneous and lagged values of *M&A* are insignificant, again suggesting that M&As have no effect on government size.

While the reported coefficients on greenfield FDI represent the immediate, or short-run, effect of a change in *GFI* on *GGFCE*, the positive and statistically significant coefficients on the lagged dependent variable indicate that greenfield FDI also has a persistent, or long-run, effect on government size. The calculation of the long-run effect of greenfield FDI on government size from the (significant) short-run effects in columns (a) and (c) yields values of 0.50 and 0.35.³⁶ These values imply that, in the long run, each dollar of greenfield FDI increases government spending by approximately 50 and 35 cents, respectively. It thus appears that the long-run effect of a change in greenfield FDI is significantly greater than the short-run effect of a change in greenfield FDI.

However, the values presented in Table 6 should be viewed with some caution given that the system GMM estimator may suffer from substantial finite sample biases due to weak instruments (e.g. Bun and Kiviet, 2006; Bun and Windmeijer, 2010). Therefore, we prefer the fixed-effects estimation

³⁶ The long-run effect is calculated by dividing the (sum of the) significant short-run effect(s) by $(1 - \lambda)$, where λ is the (sum of) the significant coefficient(s) on the lagged dependent variable.

results (presented in Table 4). Another reason for this preference is that, with the exception of *Growth* in column (c), none of the other explanatory variables is statistically significant in Table 6.

Results for developed and developing countries: Rodrik (1998) finds that the positive association between economic openness and government size exists for both high and low-income countries. We split the sample into sub-samples of developed countries and developing plus transition countries to examine whether the positive effect of greenfield FDI and the insignificant effect of M&As on government size hold for both sub-samples. The country groupings follow those in the IMF's *World Economic Outlook*, for the years 2003-2007 (IMF, 2008)—more than half of the sample period. Table A1 in the Appendix provides a list of countries included in the samples.

Table 7 presents the results. The size of the coefficient on greenfield investment is similar in both samples, and it remains statistically significant for both developed and developing countries. In contrast, the sign of the coefficient on M&As 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 7]

Results for disaggregated categories of government spending: In Table 8, we estimate the effects of greenfield FDI and M&As on disaggregated government expenditures, again using our baseline fixed-effects specification. Although not shown for the sake of brevity, each regression includes the same control variables used in the regressions in Table 4.

As can be seen, government expenditures for economic affairs depend positively on M&As (with a coefficient of 0.011); expenditures for general public services, environment protection, housing and community amenities, and social protection depend negatively on M&As (with coefficients of -0.004, -0.001, -0.001, and -0.008, respectively); all other expenditure–M&A relationships are

insignificant. Interestingly, the sum of the significant coefficients is close to zero, which is consistent with our finding that M&As have no statistically significant effect on aggregate government spending. This invites the cautious conclusion that M&As leave the size of government expenditures unchanged, while they induce a shift in government spending away from general public services, environment protection, housing and community amenities, and social protection toward economic affairs.

Greenfield FDI is not significantly related to most expenditure categories, with the exception of environment protection, housing and community amenities, and social protection. More specifically, it is negatively related to housing and community amenities and positively related to environment protection and social protection. Here, the sum of the significant coefficients on *GFI* is greater than zero. The implication is that—consistent with our results from the previous sections—an increase in greenfield FDI increases aggregate government spending. Another important point is that the size of the coefficient on *GFI* in the equation with expenditure for social protection is relatively high. This suggests that the role of the government in reducing exposure to risk from greenfield FDI is manifested most prominently in increased social security spending, as one would expect from the compensation hypothesis.

[Table 8]

4. Summary and Conclusion

According to the compensation hypothesis, economic openness affects government size by increasing economic insecurity and the demand for government spending in order to provide better state protection and public risk sharing (e.g. Garrett 1998; Rodrik 1998). In testing the empirical validity of this hypothesis, 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, we assessed the effects of total FDI, greenfield FDI, and M&As on government size. Specifically, we examined the question 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

(e.g., Scheve and Slaughter, 2004) and this exposure to risk in labour markets is a powerful determinant of people's preferences for state protection and public risk sharing (e.g. Iversen and Cusack, 2000; Rodrik, 1998). We hypothesized that greenfield FDI increases labour market volatility and government size more strongly than M&As.

Using a large panel of up to 130 developed and developing countries over the period from 2003 to 2011, the first step of our analysis revealed that greenfield FDI increases labour market volatility, and therefore economic insecurity; in contrast, M&As do not have a significant effect on labour market volatility. In the second step of our analysis, we found 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 host countries, as well as in the sub-samples of developed and developing countries. This suggests 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 effects of inward FDI on government size.

It has important policy implications that we find robust support for the compensation hypothesis only for greenfield FDI, but not for M&As. Policymakers in developed and developing host countries alike typically prefer greenfield FDI over M&As. For instance, Blomström and Kokko (2003) observed that policymakers compete mainly for greenfield FDI by offering subsidies and incentives. The economic rationale of this policy has already been questioned by Ashraf et al. (2016), who do not find productivity enhancing effects of greenfield FDI in developed and developing host countries. The analysis in the present paper provides an additional reason for questioning the economic rationale of primarily promoting inflows of greenfield FDI since this type of FDI is associated with greater labour market volatility. At the same time, the positive effects of greenfield FDI on government size offer a fairly embarrassing explanation of why policymakers prefer greenfield FDI over M&As: This preference could reflect their self-interest to command over larger public budgets.

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Table 1. The Effects of Greenfield FDI and M&As on Labour Market Volatility: Baseline Results

	(a)	(b)	(c)	(d)	(e)
<i>Panel A: Full sample</i>					
<i>GFI</i>	0.00012*** (3.77)	0.00011*** (3.61)	0.06691		
<i>M&A</i>				-0.00002 (-0.61)	-0.00001 (-0.16)
<i>GDPvol</i>		0.13689*** (70.61)	0.20130		0.12753*** (10.87)
<i>Trade</i>		0.00020*** (7.21)	0.67924		0.00022*** (5.26)
<i>Govern</i>		-0.01273** (-2.68)	-0.72660		-0.01388*** (-2.95)
<i>Recession</i>		0.01447*** (9.61)	0.10723		0.01218*** (7.15)
Observations	473	454		380	370
Countries	121	117		118	114
R ² (within)	0.02	0.21		0.04	0.19
<i>Panel B: Common sample</i>					
<i>Greenfield</i>	0.00013*** (4.09)	0.00008** (2.03)			
<i>M&A</i>				0.00001 (-0.16)	0.00005 (0.77)
<i>GDPvol</i>		0.21689*** (11.53)			0.22367*** (13.39)
<i>Trade</i>		0.00028*** (5.35)			0.00030*** (5.26)
<i>Govern</i>		-0.0190*** (-3.73)			-0.01876*** (-3.69)
<i>Recession</i>		0.01224*** (5.99)			0.01204** (6.00)
Observations	350	350		350	350
Countries	108	108		108	108
R ² (within)	0.04	0.25		0.03	0.25

Notes: The dependent variable is employment volatility (*Empvol*), measured as the five-year moving standard deviation of employment growth (computed as the first difference of the log of the employed labour force). Column (c) reports the standardised beta coefficients for the (significant) estimates in column (b) of panel A. Although the standard deviation of a (binary) dummy variable is not meaningful, the standardised beta coefficient of the crisis dummy variable is reported for completeness. Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) indicate significance at the 1% (5%) level.

Table 2. The Effects of Greenfield FDI and M&As on Labour Market Volatility: Alternative Measures of Labour market Volatility

	(a)	(b)	(c)	(d)
<i>GFI</i>	0.00400*** (3.20)		0.00005 (0.62)	
<i>M&A</i>		-0.00349 (-0.58)		-0.00002 (-0.13)
<i>GDPvol</i>	13.04493*** (11.57)	16.53929*** (14.70)	0.4324*** (11.58)	0.43471*** (20.04)
<i>Trade</i>	0.00684*** (7.28)	0.00563*** (2.85)	0.00005 (1.44)	0.00010** (2.02)
<i>Govern</i>	-0.7219*** (-5.17)	-0.8626*** (-6.81)	-0.00413 (-0.91)	-0.01148*** (-3.89)
<i>Recession</i>	0.13888*** (3.12)	0.15051*** (3.36)	0.00364 (0.88)	0.00081 (0.25)
Observations	471	382	381	331
Countries	122	120	97	96
R ² (within)	0.24	0.33	0.18	0.20

Notes: In columns (a) and (b), the dependent variable is unemployment volatility (*Unempvol*), measured as the five-year moving standard deviation of the change in the unemployment rate (expressed in percentage points). In columns (c) and (d), the dependent variable is labour income volatility (*Labincomevol*), measured as the five-year moving standard deviation of the growth rate of labour income per worker (computed as the first difference of the log of labour income per worker). Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (***) indicate significance at the 1% (5%) level.

Table 3. The Effects of Greenfield FDI and M&As on Labour Market Volatility: Additional Control Variables

	(a)	(b)	(c)	(d)
<i>GFI</i>	0.00012*** (3.98)		0.00454*** (2.84)	
<i>M&A</i>		0.00006 (0.96)		-0.00537 (-1.19)
<i>GDPvol</i>	0.22526*** (14.00)	0.21406*** (10.66)	12.46438** (6.74)	12.66815*** (6.28)
<i>Trade</i>	0.00024*** (10.39)	0.00026*** (6.57)	0.00694*** (5.59)	0.00804*** (5.78)
<i>Govern</i>	-0.01536** (-2.22)	-0.01773** (-2.44)	-0.71505*** (-6.13)	-0.76474*** (-5.01)
<i>Recession</i>	0.01491*** (11.77)	0.01262*** (8.44)	0.13627*** (3.70)	0.15491*** (3.61)
<i>Labfree</i>	-0.00016 (-1.52)	-0.00026** (-2.42)	-0.0060** (-2.56)	-0.00945*** (-10.66)
<i>FDIvol</i>	-0.00012 (-0.43)	-0.00026 (-1.14)	-0.02089** (-2.29)	-0.02613** (-2.19)
<i>Inflation</i>	0.00011*** (3.21)	0.00011*** (4.55)	0.00257* (1.79)	0.00346*** (3.19)
Observations	432	356	449	368
Countries	112	109	117	115
R ² (within)	0.27	0.25	0.25	0.29

Notes: In columns (a) and (b), the dependent variable is employment volatility (*Empvol*), measured as the five-year moving standard deviation of employment growth (computed as the first difference of the log of the employed labour force). In columns (c) and (d), the dependent variable is unemployment volatility (*Unempvol*), measured as the five-year moving standard deviation of the change in the unemployment rate (expressed in percentage points). Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.

Table 4. The Effects of Total FDI, Greenfield FDI, and M&As on Government Size: Baseline Results

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
<i>Panel A: Full sample</i>							
<i>FDI</i> <i>total</i>	0.019*** (3.02)	0.017** (2.03)					
<i>GFI</i>			0.023*** (3.57)	0.024*** (3.47)	0.048		
<i>M&A</i>						-0.002 (-0.76)	-0.003 (-1.14)
<i>Growth</i>		-0.048** (-2.28)		-0.027 (-1.34)			-0.007 (-0.29)
<i>Dep</i>		0.060*** (4.48)		0.075*** (5.15)	0.253		0.054*** (4.65)
<i>Urbanpop</i>		0.206*** (13.08)		0.267*** (10.55)	1.170		0.052 (1.37)
<i>Unemp</i>		0.069* (1.92)		0.062 (1.51)			0.073* (1.93)
<i>Corruption</i>		1.478** (5.39)		0.950*** (3.54)	0.186		1.031*** (5.11)
Observations	1127	1114	1077	1068		843	839
Countries	130	129	130	129		128	127
R ² (within)	0.09	0.12	0.11	0.15		0.15	0.18
<i>Panel B: Common sample</i>							
<i>FDI</i> <i>total</i>	0.000 (0.01)	-0.005 (-0.99)					
<i>GFI</i>			0.050*** (3.81)	0.056*** (3.93)			
<i>M&A</i>						0.010 (1.61)	0.017 (1.44)
<i>Growth</i>		0.038 (1.36)		0.023 (0.86)			0.038 (0.87)
<i>Dep</i>		-0.252*** (-4.64)		-0.299*** (-6.29)			-0.255*** (-3.71)
<i>Urbanpop</i>		0.224*** (3.99)		0.225*** (3.82)			0.222*** (-4.32)
<i>Unemp</i>		0.016 (1.03)		0.003 (0.20)			0.018 (1.01)
<i>Corruption</i>		0.653** (2.23)		0.529** (2.77)			0.630** (2.00)
Observations	350	350	350	350		350	350
Countries	108	108	108	108		108	108
R ² (within)	0.21	0.25	0.25	0.30		0.21	0.25

Notes: The dependent variable is *GGFCE*. Column (e) reports the standardised beta coefficients for the (significant) estimates in column (d) of panel A. Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.

Table 5. The Effects of Total FDI, Greenfield FDI, and M&As on Government Size: Additional Control Variables and Lags of Greenfield FDI and M&As

	(a)	(b)	(c)	(d)
<i>GFI</i>	0.024*** (3.17)		0.016*** (2.91)	
<i>GFI (t-1)</i>			0.013** (2.25)	
<i>M&A</i>		-0.001 (-0.11)		0.023 (1.12)
<i>M&A (t-1)</i>				0.014 (0.91)
<i>Growth</i>	-0.034 (-1.10)	-0.022 (-0.71)	-0.090*** (-6.25)	-0.054** (-1.99)
<i>Dep</i>	0.050*** (3.35)	0.049 (1.48)	0.053*** (3.55)	0.014 (0.23)
<i>Urbanpop</i>	0.243*** (9.10)	0.035 (1.55)	0.207*** (5.85)	-0.064*** (-3.61)
<i>Unemp</i>	0.057 (1.01)	0.065 (1.43)	-0.011 (-0.34)	-0.009 (-0.24)
<i>Corruption</i>	1.507*** (4.58)	1.385*** (9.03)	1.873*** (5.66)	1.672*** (4.38)
<i>Inflation</i>	-0.008 (-0.49)	-0.017 (-1.29)	-0.023** (-2.55)	-0.026** (-2.28)
<i>Interstrate</i>	-0.027*** (-4.77)	-0.028*** (-4.24)	-0.037*** (-8.71)	0.089*** (3.98)
<i>Density</i>	-0.0003** (-2.01)	-0.0004 (-1.51)	-0.0001 (-0.36)	-0.0007** (-2.95)
<i>Democracy</i>	-1.156*** (-3.18)	-1.303** (-2.30)	-0.713 (-1.25)	-0.563 (-0.74)
Observations	824	647	707	481
Countries	110	106	109	92
R ² (within)	0.23	0.28	0.28	0.25

Notes: The dependent variable is *GGFCE*. Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.

Table 6. The Effects of Greenfield FDI and M&As on Government Size: System GMM Results

	(a)	(b)	(c)	(d)
<i>GGFCE</i> (t-1)	0.621** (2.18)	1.244*** (3.79)	0.797** (2.22)	0.190 (0.51)
<i>GGFCE</i> (t-2)			0.145 (0.50)	0.862 (2.14)
<i>GFI</i>	0.189** (2.36)		0.070*** (2.62)	
<i>GFI</i> (t-1)			-0.022 (-1.16)	
<i>M&A</i>		0.011 (0.05)		0.073 (0.39)
<i>M&A</i> (t-1)				-0.016 (-0.32)
<i>Growth</i>	-0.057 (-0.76)	0.028 (0.53)	-0.330** (-2.05)	0.030 (0.12)
<i>Growth</i> (t-1)			0.085 (0.59)	-0.067 (-0.92)
<i>Dep</i>	0.022 (1.09)	-0.008 (-0.39)	-0.122 (-0.39)	0.465 (1.18)
<i>Dep</i> (t-1)			0.144 (0.48)	-0.467 (-1.23)
<i>Urbanpop</i>	0.021 (1.60)	-0.007 (-0.79)	0.262 (0.23)	-1.570 (-1.42)
<i>Urbanpop</i> (t-1)			-0.259 (-0.22)	1.511 (1.38)
<i>Unemp</i>	0.090 (1.03)	-0.081 (-0.83)	-0.111 (-0.26)	-0.222 (-0.50)
<i>Unemp</i> (t-1)			-0.117 (-0.37)	0.155 (0.41)
<i>Corruption</i>	1.294 (1.52)	-0.631 (-0.67)	-0.694 (-0.30)	-1.983 (-0.96)
<i>Corruption</i> (t-1)			0.890 (0.34)	0.904 (0.40)
Observations	947	757	803	568
Countries	129	127	128	110
Instruments	17	17	35	35
AR2 (p value)	0.064	0.702	0.903	0.664
Hansen test (p value)	0.191	0.750	0.991	0.744

Notes: The dependent variable is *GGFCE*. All results are two-step GMM estimates. Period dummies are not reported. We treat the lagged dependent variable always as a predetermined variable. The estimates in columns (a) and (b) treat *GFI* and *M&A* as endogenous, while *Growth*, *Dep*, *Urbanpop*, *Unemp*, and *Corruption* are treated as strictly exogenous. In columns (c) and (d), all explanatory variables (except the time dummies) are treated as endogenous. To avoid too many instruments, we collapsed the instrument matrix and used only the second lag of the variables as instruments. Robust *t*-statistics based on heteroskedasticity-consistent standard errors with the Windmeijer (2005) finite sample correction are in parentheses. *** (**) indicate significance at the 1% (5%) level.

Table 7. The Effects of Greenfield FDI and M&As on Government Size: Sub-Sample Results

	(a)	(b)	(c)	(d)
	<i>Panel A: Developed countries</i>			
<i>GFI</i>	0.033** (2.08)	0.042** (2.02)		
<i>M&A</i>			-0.002 (-0.71)	-0.003 (-0.86)
<i>Growth</i>		-0.078** (-2.39)		-0.099** (-2.40)
<i>Dep</i>		0.289*** (16.82)		0.309*** (18.13)
<i>Urbanpop</i>		-0.078* (-1.72)		-0.096** (-2.33)
<i>Unemp</i>		0.126*** (2.86)		0.113*** (2.40)
<i>Corruption</i>		1.200*** (3.92)		1.248*** (3.73)
Observations	268	268	259	259
Countries	30	30	30	30
R ² (within)	0.42	0.57	0.42	0.58
	<i>Panel B: Emerging and developing countries</i>			
<i>GFI</i>	0.023*** (3.65)	0.025*** (3.60)		
<i>M&A</i>			0.0004 (0.04)	0.0002 (0.03)
<i>Growth</i>		-0.024 (-1.21)		-0.001 (-0.06)
<i>Dep</i>		0.015 (0.79)		-0.037 (-1.62)
<i>Urbanpop</i>		0.351*** (10.86)		0.063 (1.18)
<i>Unemp</i>		0.012 (0.33)		0.025 (0.68)
<i>Corruption</i>		1.109*** (3.20)		1.347*** (4.60)
Observations	809	800	584	580
Countries	100	99	98	97
R ² (within)	0.10	0.13	0.12	0.14

Notes: The dependent variable is *GGFCE*. Coefficients on country and time-fixed effects are not reported. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.

Table 8. The Effects of Greenfield FDI and M&As on General Government Expenditures by Function

	<i>Dependent variable (as a percentage of GDP)</i>			
	<i>General public services</i>		<i>Defence</i>	
<i>GFI</i>	0.015 (0.66)		-0.002 (-0.30)	
<i>M&A</i>		-0.004*** (-2.86)		0.001 (0.37)
Observations	260	251	260	251
Countries	30	30	30	30
R ² (within)	0.21	0.21	0.13	0.14
	<i>Education</i>		<i>Health</i>	
<i>GFI</i>	0.009 (1.59)		-0.003 (-0.21)	
<i>M&A</i>		-0.002 (-1.38)		0.002 (1.09)
Observations	260	251	260	251
Countries	30	30	30	30
R ² (within)	0.29	0.28	0.41	0.41
	<i>Public order and safety</i>		<i>Economic affairs</i>	
<i>GFI</i>	0.002 (0.81)		0.003 (0.34)	
<i>M&A</i>		0.001 (1.43)		0.011** (1.98)
Observations	260	251	260	251
Countries	30	30	30	30
R ² (within)	0.20	0.19	0.11	0.11
	<i>Environment protection</i>		<i>Housing and community amenities</i>	
<i>GFI</i>	0.007** (2.35)		-0.008*** (-3.85)	
<i>M&A</i>		-0.001* (-1.87)		-0.001*** (-3.09)
Observations	260	251	260	251
Countries	30	30	30	30
R ² (within)	0.20	0.19	0.15	0.15
	<i>Recreation, culture and religion</i>		<i>Social protection</i>	
<i>GFI</i>	0.002 (0.90)		0.018** (2.35)	
<i>M&A</i>		0.0002 (-0.25)		-0.008** (-2.56)
Observations	260	251	260	251
Countries	30	30	30	30
R ² (within)	0.24	0.23	0.77	0.77

Notes: Other regressors not shown in the table: time dummies, country dummies, *Growth*, *Dep*, *Urbanpop*, *Unemp*, and *Corruption*. Robust *t*-statistics (calculated with Driscoll and Kraay (1998) standard errors) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.

Table A1. List of Countries and their Classification

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

Notes: The number "1" ["2"] indicates that the country was included in the subsample of 100 [30] emerging and developing [advanced] economies (according to IMF (2008) classification).

Table A2. Summary Statistics

	<i>Mean</i>	<i>Max.</i>	<i>Minimum</i>	<i>Std. Dev.</i>	<i>Observations</i>
<i>FDItotal</i>	4.846	76.327	-55.066	6.886	1164
<i>GFI</i>	6.516	106.287	0.011	10.710	1112
<i>M&A</i>	1.229	93.283	-19.184	5.040	863
<i>Empvol</i>	0.015	0.101	0.000086	0.017	484
<i>GDPvol</i>	0.028	0.399	0.003	0.025	508
<i>Trade</i>	92.472	447.058	22.090	56.410	1138
<i>Govern</i>	0.203	1.996	-2.260	0.970	1169
<i>Recession</i>	0.016	1	0	0.126	1170
<i>GGFCE</i>	15.391	46.601	2.047	5.382	1128
<i>Growth</i>	4.232	54.158	-62.077	5.235	1160
<i>Dep</i>	59.712	108.114	16.543	18.153	1170
<i>Urbanpop</i>	59.504	100	11.606	23.592	1170
<i>Unemp</i>	7.797	37.6	0.3	5.163	1161
<i>Corruption</i>	0.127	2.553	-1.816	1.052	1169

Notes: Although the standard deviation of a binary variable is not meaningful, we report the standard deviation of the crisis dummy variable for completeness.

Table A3. The Effects of Greenfield FDI and M&As on Labour Market Volatility and Government Size: Random-Effects Results

	Dependent variable			
	<i>Empvol</i>		<i>GGFCE</i>	
<i>GFI</i>	0.00011*		0.022***	
	(1.82)		(3.67)	
<i>M&A</i>		-0.00012		-0.017
		(-0.44)		(-1.18)
<i>GDPvol</i>	0.14618***	0.18174***		
	(4.24)	(4.75)		
<i>Trade</i>	0.00006***	0.00003		
	(2.52)	(1.54)		
<i>Govern</i>	0.00151	0.00173		
	(1.03)	(1.13)		
<i>Recession</i>	0.01506***	0.01174***		
	(7.14)	(4.74)		
<i>Growth</i>			-0.066***	-0.056***
			(-4.90)	(-4.32)
<i>Dep</i>			0.051***	0.032*
			(2.97)	(1.76)
<i>Urbanpop</i>			0.054***	0.049***
			(2.98)	(2.72)
<i>Unemp</i>			0.139***	0.152***
			(5.00)	(5.93)
<i>Corruption</i>			1.8914***	1.769***
			(6.76)	(6.18)
Observations	454	370	1068	839
Countries	117	114	129	127
Hausman test (<i>p</i> value)	0.001	0.040	0.000	0.001

t-statistics (based on OLS standard errors.) are in parentheses. *** (**) [*] indicate significance at the 1% (5%) [10%] level.