

Chapter 3

Globalisation, decentralisation and inclusive growth

by

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This chapter extends the analysis of decentralisation and inclusive growth to capture the role of globalisation. Country specificities turn out to matter: while countries have already decentralised spending and revenues more than enough given their openness and scale, other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Depending on a country's characteristics and its public finance mix, the scope for further improvements of both growth and equity outcomes varies widely. Spending and revenue decentralisation tend to boost economic growth for economies that have a relatively higher degree of trade openness. Fiscal decentralisation has a more ambiguous and possibly even negative effect on inequality than on growth, especially for economies with a higher degree of globalisation. Moreover, for some countries, there is an apparent trade-off between growth and equity, when it comes to the "optimal" degree of spending and revenue decentralisation.

Introduction¹

Globalisation is a powerful force that can create large economic gains through greater economies of scale and scope, but it also exposes economies to shocks that can result in both winners and losers. Increasing attention is being placed on how policies should respond to greater degrees of globalisation and openness, in light of sluggish growth and high inequality in many countries (OECD, 2017). Centralisation and decentralisation of spending and revenue is a broad policy option that many countries have employed, in part to offset the increased volatility associated with aspects of greater openness to trade and investment flows. The relative size of countries and their governments – both central and sub-central – also play a role in determining the right degree of decentralisation. Recent OECD analyses have examined how the public finance mix and the size of governments together affect growth and equity (Fournier and Johansson, 2016; Cournede et al., 2017, Boadway and Dougherty 2018). These studies find evidence that decentralisation is a positive “win” for economic growth and likely for equity as well.

In order to clarify these interrelationships, this paper takes advantage of two recently compiled datasets, one on public finance and growth (Bloch et al., 2016), and the other on income distribution (Murtin et al., 2016). The analytical framework is a combination of growth regressions (*à la* Barro, 2015) and estimates of income decile ratios. This follows from the framework developed in Fournier and Johansson (2016), which was also used for economic growth and decentralisation in the previous chapter by Blöchliger and Akgun.

This chapter adds countries’ degree of globalisation to the analysis of decentralisation and government size, and finds that with this additional channel, the apparent “win-win” outcome for growth and equity becomes considerably more complex. Country specificities really matter: some countries have already decentralised spending and revenues more than enough given their openness and scale, and these would benefit from more centralisation, while other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Depending on a country’s characteristics and its public finance mix, the scope for further improvements of *both* growth and equity outcomes varies widely. Moreover, for some countries, there is an apparent trade-off between growth and equity, when it comes to the “optimal” degree of spending and revenue decentralisation.

Beyond the main message that country specificities matter, some broad findings include:

- Government expenditure *tends to be higher and more centralised on average* in open economies that are exposed to a greater degree of terms-of-trade volatility.
- Spending and revenue decentralisation tend to *boost economic growth* for economies that have a relatively *higher degree of trade openness*. This is especially true if spending is locally financed.
- Fiscal decentralisation has a *more ambiguous and possibly even negative effect on inequality* than on growth, especially for economies with a *higher degree of globalisation*. However, revenue decentralisation is more pro-equity than spending decentralisation in the typical economy’s case.

The rest of this chapter proceeds by first discussing the interlocking literatures on globalisation, decentralisation, government size, growth and inequality. Second, the empirical methodology for estimating and identifying the effect of decentralisation on growth and inequality is explained. Third, the data construction is described, and the main regression results are discussed. Fourth, the country-specific marginal effects are presented along with summary results. The last section concludes.

Connecting decentralisation outcomes with globalisation

Globalisation and government size

Globalisation and government size are closely inter-related empirically. As Dani Rodrik (1998) showed, more open economies can motivate governments to provide greater social insurance, in the form of a larger size of government. The existence of more intensive forms of external risk and volatility, notably in the form of terms-of-trade shocks, means that more open economies will push for greater government transfers—social security, pensions, unemployment insurance, job training, and so forth—that mitigate external risk. The relationship between openness, terms-of-trade volatility and overall government expenditure is robust, as show in Table 3.1, including for the period spanning the global financial crisis. Less-often discussed is the relationship with *sub-national* government spending, which is in the opposite direction for both openness and volatility. At both the overall and sub-national levels, the interaction of openness and volatility has a further correlation with government spending in the same (opposite) directions, which can also be seen in the cross-section of country observations, in Figure 3.1. These contrasting correlations suggest that decentralisation may play a complementary role in facing globalisation’s risks.

Table 3.1. **Correlations of overall and local government size with globalisation**

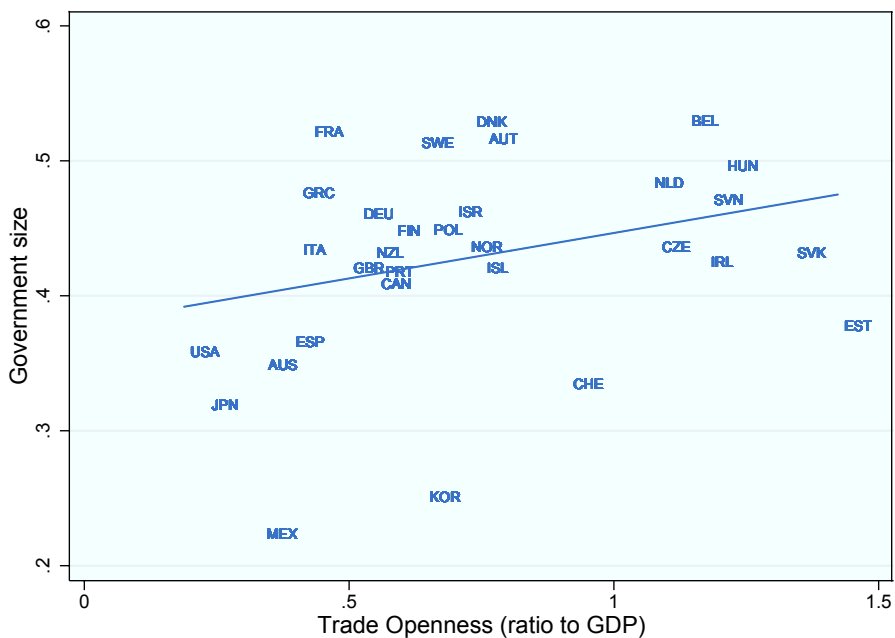
OLS regressions				
	Overall government expenditure (% of GDP)		Local government expenditure (% of total)	
<i>Globalisation measures</i>				
Openness	0.035** (0.017)	0.037* (0.021)	-0.036*** (0.01)	-0.017** (0.0073)
Terms of trade volatility	0.0057* (0.0031)	0.0072** (0.0035)	-0.0050*** (0.0018)	-0.0060*** (0.0017)
Terms of trade volatility x Openness	0.022*** (0.0066)	0.023*** (0.007)	-0.0089** (0.0044)	-0.0078 (0.0048)
<i>Control variables</i>				
Urbanisation	0.11 (0.092)	0.072 (0.11)	-0.24*** (0.058)	-0.20*** (0.077)
Population growth	-1.87*** (0.56)	-1.79** (0.70)	0.82* (0.43)	0.19 (0.37)
GDP per capita growth	-0.51*** (0.07)	-0.45*** (0.086)	0.076** (0.037)	0.063 (0.042)
Government size			0.12*** (0.039)	0.12*** (0.037)
Observations	1 113	889	598	400
R-squared	0.162	0.119	0.198	0.168
Sample	Full	Pre-crisis	Full	Pre-crisis

Note: Based on country-year observations over the 1980-2015 period (full) or 1980-2008 (pre-crisis).

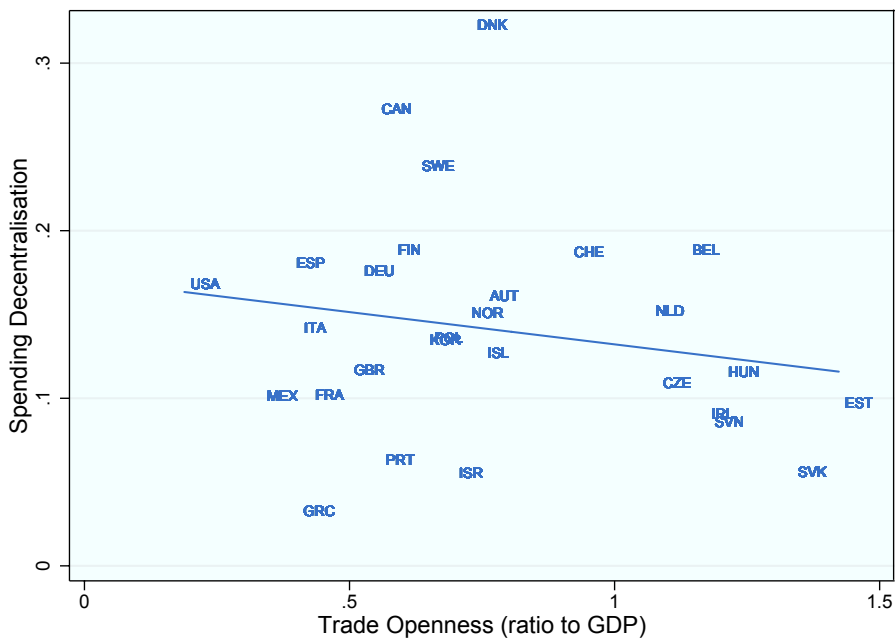
Source: Computations based on OECD Public Finance database.

Figure 3.1. Central and local government spending relate to globalisation (openness) in opposite ways

Panel A: Overall government size and trade openness



Panel B: Local government share and trade openness



Note: Data refer to 2013-14.

Source: OECD Fiscal Federalism database.

Government size, country size and (de)centralisation are also closely related. As shown by Alberto Alesina (2003), “optimal” country size can be determined through a cost-benefit analysis, balancing the benefits of size and the costs of heterogeneity. In a large country, per capita costs may be low, but the heterogeneous preferences of a large population make it hard to deliver services and formulate policy. Smaller countries may find it easier to respond to citizen preferences in a democratic way. Decentralisation can be considered as an extension of this problem, seeking to address heterogeneity while maintaining territorial cohesion. In this paper, we will focus on *fiscal* decentralisation, defined in a traditional way, for state and local spending and revenues, as a share of overall totals. In the traditional Musgrave-Oates formulation, fiscal federalism theory implies that the benefits of decentralisation are positively correlated with variation in demand for publicly provided goods (Musgrave, 1959; Oates, 1972). The literature by Alesina and collaborators (Alesina and Spolaore, 1997; Alesina and Wacziarg, 1998; Alesina et al., 2005) suggests that in general, globalisation may reduce the costs of and increase the supply of decentralisation, as an answer to demands for greater local authority. Paradoxically, a high degree of globalisation may actually trigger greater fiscal *centralisation*, particularly of tax revenues, as larger fiscal units can help to pool economic resources to provide insurance for regions affected by shocks (Garrett and Rodden, 2003). For instance, trade shocks have been shown to negatively affect the delivery of local public services in the United States, where extensive decentralisation of expenditure and revenue makes it difficult for trade-exposed localities to make up for lost revenues (Feler and Senses, 2017).²

Decentralisation and inclusive growth, via government size

The above literature focuses on the interrelationships between globalisation, government size and decentralisation. This paper makes an additional link of all three to *inclusive growth*, simply defined as the effects on both economic growth and equity. There is a large literature on growth and decentralisation, and a fledgling one on equity and decentralisation (see Johansson, 2016). The theoretical literature on the economics of fiscal federalism has identified several potential channels through which fiscal decentralisation influences economic growth. The traditional literature focuses on the efficiency aspects of decentralisation (Tiebout, 1956). Decentralisation increases economic efficiency as local governments can be better than national governments in providing services to citizens due to closeness and informational advantages. Furthermore, the possibility of experimentation and competition between local governments in the delivery of public services, coupled with mobility of households and firms, promotes a more efficient provision of services. By contrast, the more recent literature argues that decentralisation can increase corruption and government inefficiency, if local governments shield businesses operating in their jurisdiction from laws applying at the central level, thus effectively eroding the rule of law. Moreover, local governments may be more easily captured by special interests (Martinez-Vazquez and McNab, 2003).

The empirical evidence on the impact of decentralisation on growth is more ambiguous. A recent meta-analysis, based on 30 empirical studies, found that the evidence on the effect of decentralisation on growth is inconclusive (Baskaran et al., 2016). The failure to find clear-cut results partly reflects problems of measuring the autonomy of sub-federal jurisdictions accurately. Nonetheless, two recent OECD studies found that fiscal decentralisation (using various measures) was positively associated with GDP per capita (Blöchliger et al., 2013, 2017). Furthermore, the impact of decentralisation was found to be stronger for revenue than for spending decentralisation, and the main mechanism appears to be via government size.

Similar to the literature on growth, the theoretical and empirical literature provides no clear-cut answer on the link between fiscal decentralisation and inequality (Tselios, 2012). Fiscal decentralisation can reduce inequality. Decentralisation brings governments closer to their citizens, making local officials better informed about local needs than central governments. By contrast, fiscal decentralisation may lower the likelihood of attracting skilled officials as the supply of skills may be limited at the local level and, in turn, reducing the efficiency in delivering redistributive policies (Prud'homme, 1995). A recent OECD study provides ambiguous results on the association between fiscal decentralisation and inequality, with the results depending on the particular inequality and decentralisation measure considered in the analysis (Blöchliger, Bartolini and Stossberg, 2016).

Methodology

Following the recent literature on the effects of public policy, two main equations are estimated separately for economic growth and income inequality (Fournier and Johansson, 2016). The growth equation is based on the literature using the time series variation in the data to identify the long-run effects of public policy, such as Gemmell, Kneller and Sanz (2013) while the inequality equation follows Stossberg, Bartolini and Blöchliger (2016).

The growth equation

The effect of decentralisation on economic growth is estimated using a regression model derived from the neoclassical growth theory. Assuming a Cobb-Douglas technology and that the countries are operating in their steady state income level, Mankiw, Romer and Weil (1992) showed that the per capita GDP levels can be expressed as a linear function of the logarithm of the rate of savings and the rate of population growth. They further extended the analysis by adding the rate of investment to the human capital stock into the equation and provided evidence in favour of a better explanatory power of this extended model. Following this paper and the literature on convergence (Barro, 2015; Barro and Sala-i-Martin, 1992) the growth equation is formulated as

$$\begin{aligned} \Delta \ln y_{i,t} = & \phi \ln y_{i,t-1} + \beta' X_{i,t-1} + \delta_1 \text{GLOB}_{i,t-1} + \delta_2 \text{GOVSIZE}_{i,t-1} + \delta_3 \text{DEC}_{i,t-1} \\ & + \theta_1' (\text{GOVSIZE}_{i,t-1} * \text{DEC}_{i,t-1}) + \theta_2 (\text{GLOB}_{i,t-1} * \text{GOVSIZE}_{i,t-1}) + \\ & \theta_3' (\text{GLOB}_{i,t-1} * \text{DEC}_{i,t-1}) + \gamma' \Delta Z_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where $y_{i,t}$ is per capita GDP level, $X_{i,t}$ is a vector of variables proxying the variables predicted by economic theory, namely, the logarithm of investment as a share of GDP, population growth and the growth rate of the human capital stock. As argued by Fournier and Johansson (2016), due to possible persistent imbalances, the investment rate is better linked to capital accumulation as compared with the savings rate. The human capital stock is measured by the average years of schooling of the working age population. The growth rate of this variable is used as a proxy for the rate of investment in the human capital stock.

The variables of interest, namely, $\text{GLOB}_{i,t}$, $\text{GOVSIZE}_{i,t}$ and $\text{DEC}_{i,t}$ stand for a number of globalisation measures, government size and a vector of decentralisation ratios, respectively. As proxies of globalisation, several different variables are used. First is trade openness which is measured as international trade as a share of GDP and a population adjusted version of it. Second, total FDI flows and FDI inflows as share of GDP are used as alternative globalisation indicators. Finally, broader indicators constructed by Dreher (2006) are used. The main one is the aggregate globalisation indicator, called the KOF globalisation index, which has two sub-indices, political and social globalisation.

In addition to the policy variables appearing linearly in the equation, their products are used to control for the interactions among them. In this setting, the marginal effect of each

policy on the growth rate depends on the two other variables. For instance, the effect of decentralisation on economic growth is given by

$$\frac{\partial \Delta \ln y}{\partial \text{DEC}} = \delta_3' + \theta_1' \text{GOVSIZE} + \theta_3' \text{GLOB}$$

The previous literature on the relationship between decentralisation and economic growth, such as Gemmell, Kneller and Sanz (2013) and Ligthart and Oudheusden (2017), assumed that the effect does not vary through time and across countries. The interaction terms introduced here allows the effect of decentralisation to be *heterogeneous*.

Equation (1) is flexible in the sense that it allows to distinguish between short-term or growth effects of policy and their long-term effects on the level of GDP per capita. It can also be written in an error-correction model (ECM) form as

$$\begin{aligned} \Delta \ln y_{i,t} = & \phi [\ln y_{i,t-1} - \beta^* X_{i,t-1} - \delta_1^* \text{GLOB}_{i,t-1} - \delta_2^* \text{GOVSIZE}_{i,t-1} - \delta_3^* \text{DEC}_{i,t-1} \\ & - \theta_1^* (\text{GOVSIZE}_{i,t-1} * \text{DEC}_{i,t-1}) - \theta_2^* (\text{GLOB}_{i,t-1} * \text{GOVSIZE}_{i,t-1}) \\ & - \theta_3^* (\text{GLOB}_{i,t-1} * \text{DEC}_{i,t-1})] + \gamma' \Delta Z_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}, \end{aligned} \quad (2)$$

where now the parameters of the policy variables measure explicitly the long-term effects.

The inequality equation

To measure the effect of decentralisation on household income inequality, a methodology similar to the one for economic growth is followed. Namely, the effect of decentralisation on the measures of inequality is allowed to be depending on other policy variables. The baseline estimation equation follows closely Stossberg, Bartolini and Blöchliger (2016), but it is extended to allow for interactive effects. This equation is given by

$$\begin{aligned} \ln \text{INEQ}_{i,t} = & \beta' X_{i,t} + \delta_1 \text{GLOB}_{i,t} + \delta_2 \text{GOVSIZE}_{i,t} + \delta_3 \text{DEC}_{i,t} \\ & + \theta_1' (\text{GOVSIZE}_{i,t} * \text{DEC}_{i,t}) + \theta_2 (\text{GLOB}_{i,t} * \text{GOVSIZE}_{i,t}) + \theta_3' (\text{GLOB}_{i,t} * \text{DEC}_{i,t}) \\ & + \mu_i + \lambda_t + \varepsilon_{i,t}, \end{aligned} \quad (3)$$

where $\text{INEQ}_{i,t}$ is a measure of income inequality and $X_{i,t}$ represents a vector of control variables while $\text{GLOB}_{i,t}$, $\text{GOVSIZE}_{i,t}$ and $\text{DEC}_{i,t}$ are the policy variables as defined above. In the baseline model, the logarithmic difference between average disposable income of the 10th decile and the 1st decile is used as a general measure of income inequality, i.e. $\ln \text{INEQ}_{i,t} = \ln \text{HDI10}_{i,t} - \ln \text{HDI1}_{i,t}$, where, HDI10 and HDI1 stand for average household disposable income levels of the 10th and 1st deciles, respectively. The vector of control variables, $X_{i,t}$, includes the variables which appear to be robustly affecting income inequality in the results reported by Stossberg, Bartolini and Blöchliger (2016). These are economic growth, the unemployment rate and urbanisation ratios.

Although this equation is informative and flexible, it has certain shortcomings. First, it relates the inequality indicator to stationary variables, hence, the specification is implicitly based on the assumption that the average income in different deciles do not diverge from each other in the long run. This assumption is equivalent to the hypothesis that average income in the 10th decile is cointegrated with the one in the 1st decile with a cointegration vector of (1, -1). In reality, this may or may not be true. Second, it shows the effects on the disparities between income deciles but it does not allow to distinguish between the effects of policy on income levels in different deciles.

An alternative method to study the effects of policy on income inequality is to use the level of income in different deciles or quintiles as dependent variable and relate this to a measure of average income. These alternative models are given by

$$\begin{aligned} \ln \text{HDI}(\mu)_{i,t} = & \beta_{\mu} \ln \text{MHDl}_{i,t} + \delta_{1\mu} \text{GLOB}_{i,t} + \delta_{2\mu} \text{GOVSIZE}_{i,t} + \delta'_{3\mu} \text{DEC}_{i,t} \\ & + \theta'_{1\mu} (\text{GOVSIZE}_{i,t} * \text{DEC}_{i,t}) + \theta_{2\mu} (\text{GLOB}_{i,t} * \text{GOVSIZE}_{i,t}) + \theta'_{3\mu} (\text{GLOB}_{i,t} * \text{DEC}_{i,t}) \\ & + \sum_{s=-k}^k \gamma_{s\mu} \Delta \ln \text{MHDl}_{i,t-s} + \mu_{i\mu} + \lambda_{t\mu} + \varepsilon_{\mu i,t}, \end{aligned} \quad (4)$$

where $\ln \text{HDI}(\mu)_{i,t}$, $\mu = 1, 2, \dots, n$ are the average household disposable incomes in different deciles ($n = 10$) or quintiles ($n = 5$) and $\ln \text{MHDl}_{i,t}$ is the average household disposable income. As both $\ln \text{HDI}(\mu)_{i,t}$ and $\ln \text{MHDl}_{i,t}$ are non-stationary variables this equation is intended to be a cointegration model with the cointegration vector of $(1, -\beta)$. Therefore, the parameters of the variables of interest represent the effect of decentralisation on the relative gap between the average income and income in different levels. In the event of the cointegration vector being homogeneous across equations, i.e. $\beta_{\mu} = \beta$ for all $\mu = 1, 2, \dots, n$, by taking the differences 10th decile and the 1st decile, equation (3) is obtained. Hence, equation (3) can be seen as a special case of equation (4). Furthermore, using equation (4) it is possible to test the hypothesis that the elasticity of income level in different deciles with respect to average income is equal to one. Evidence against this hypothesis can be interpreted as an unequal distribution of growth dividends (Hermansen, Ruiz and Causa, 2016).³

Estimation strategy

To investigate the growth effects of decentralisation, equation (1) is estimated using the two-way fixed effects (2WFE) method. Although this equation focuses on the growth effects rather than the long-run coefficients, it has certain advantages over its alternatives, mainly the ECM formulation in equation (2) as it is linear in parameters and allows for separate identification of long run and short run effects.

The size of the sample used for estimation of the growth equation which contains up to 29 countries, dictates the employment of annual data instead of the common practice of taking period averages in the empirical growth literature. Though annual data provide a larger sample, there is the risk that transitory effects mask the relationships of interest. To control for these effects the first differences of the right hand side variables, $\Delta Z_{i,t}$, are added. Therefore, the parameters of the policy variables show the cumulative effects, or dynamic multipliers, after a year period. The non-linear variables in the equation make the choice of the variables to enter in the vector $\Delta Z_{i,t}$ important. To construct a dynamic non-linear model one possibility is to start with a, say, ARDL(1,1) model where the interaction terms appear in period t and $t-1$. However, in this case the dynamic multipliers of interest become a function of the variables in both t and $t-1$ which complicates the interpretation of the model.⁴ In general, the dynamic multipliers will be a function of the entire history of the other explanatory variables in the model. To avoid this complication, only the first differences of linear variables are used, $\Delta Z_{i,t} = (\Delta X_{i,t}, \Delta \text{GLOB}_{i,t}, \Delta \text{GOVSIZE}_{i,t}, \Delta \text{DEC}_{i,t})$, which is, for instance, a strategy common in non-linear cointegration modelling (Choi and Saikkonen, 2010).

The estimation of the inequality equation given in (3) is less involved. As in the growth model, two-way fixed effects are added in the model to control for the unobserved country characteristics which are correlated with the right hand side variables and create persistent inequality effects. Year fixed effects capture the effects common to all countries.

Equation (4) is a co-integration equation, as both $\ln \text{HDI}(\mu)_{i,t}$ and $\ln \text{MHDI}_{i,t}$ are trending variables, extended with the stationary policy variables. The crucial property of the equation is the addition of up to k leads and lags of the nonstationary right hand side variables. Adding lags of the explanatory variable in the equation to control for endogeneity is standard in the ‘ARDL approach to co-integration’ which is sometimes called ‘order-augmented ARDL’ (Pesaran and Shin, 1998). However, in the case of a short-run feedback from the nonstationary dependent variable to the explanatory variables this approach fails to produce valid conditioning and the limiting distributions of the parameter estimates will suffer from bias, asymmetry and nuisance parameters (Phillips and Loreatan, 1991). In the present case the average household disposable income contains the income level in different deciles or quintiles as a component. Therefore, it is natural to expect a feedback relationship from the dependent variable to the right hand side. The solution to this feedback problem is to add the leads of the first differences of the explanatory variable in the estimation equation, a method suggested by and Stock and Watson (1993), among others.

Robustness

In the growth equation given in (1) both the vector $X_{i,t}$ and the policy variables are lagged for one period with respect to the dependent variable, but the first differences in the vector $\Delta Z_{i,t}$ are contemporaneously related to it. In two recent papers, Hauk and Wacziarg (2009) and Hauk (2017) argued that endogeneity may be a serious concern in empirical growth regressions and suggested that the between effects estimator (BE) is the least affected by the problem among a set of standard estimators. However, for at least two reasons BE does not fit in the current empirical set-up. First, as mentioned above, taking period averages reduce the number of observations dramatically. In the case of the BE, the number of available observations would be 29, the maximum number of countries in the dataset. Second, the BE produces an estimate of the parameter of the lagged dependent variable $\phi = 0$ as T goes to infinity, regardless of the true value (Maddala, 1971; Ditzen and Gundlach, 2016).

For these reasons, in addition to the baseline 2WFE estimations, a robustness check is conducted to deal with the possible endogeneity of using 2SLS estimators with lagged explanatory variables as instruments in both growth regressions (1) and inequality regressions (3). In the growth regressions $\Delta Z_{i,t}$ and in the inequality regressions all policy variables, their interactions and economic growth are instrumented with their lagged values of up to the third lag.

The choice between 2WFE and 2SLS estimators reflects the bias-variance trade off as the former is potentially biased and the second is potentially inefficient. For model selection, two diagnostic tests were used. First, the Sargan-Hansen test statistics (Hansen, 1982) is reported in its J-statistics form to check for the validity of the lagged instruments. Second, the difference-in-Sargan statistics is reported as a measure of the distance between the 2WFE and 2SLS estimates.

In all cases, the reported standard errors are robust to arbitrary heteroskedasticity and autocorrelation (HAC). To correct for heteroskedasticity each error term is allowed to have its own variance which is the most general option. An alternative would be to allow for heteroskedasticity only among panels. Although this would produce smaller variance estimates, under the condition that it is the true variance structure, in practice it may not be realistic. To correct for autocorrelation Newey and West (1987) estimates are reported using the Bartlett kernel with a bandwidth equal to 6.⁵ Assuming auto-correlated standard

errors in the growth regression (1) may pose a problem as the model contains a lagged dependent variable. If the model is correctly specified, HAC standard errors will overestimate the variances in this model. However, if $\phi = 0$ as discussed above, non-HAC standard errors will underestimate them and inference on the growth effects of the policy variables will be invalid.

Data

Summary statistics of the variables used in this paper and data sources are shown in Annex Table 3.A1.1. For the growth regressions, potential GDP (per capita) is used as a dependent variable instead of actual GDP in order to avoid capturing cyclical relationships and focus on long-run effects, as in Bloch et al. (2016). In order to compute the per capita value, the trend population of the population between the ages of 15 and 75 is used. The growth of population also enters in the right hand side of the equation. These two variables and the investment rate come from the OECD *Economic Outlook database*. The data on average years of schooling are taken from the OECD Long-Term Scenarios database and the growth of this variable is used in the equation. Additional sources are shown in the Annex Table.

For the inequality regressions, data on disposable income levels at different income deciles are used, from the OECD project on multi-dimensional living standards (Boarini et al., 2016). This original database covers different measures of income, longevity and employment. In this paper, both levels of income at different deciles and a ratio measure of income inequality are computed from these variables, namely the logarithm of ratio of the average disposable income in the 10th and 1st decile. The latest year covered by the dataset is 2015 for all countries covered, and data availability ranges from 10 years for Korea to 42 years for the United States.

Three globalisation indicators are used in the empirical analysis. The first one is trade openness, defined as the sum of imports and exports divided by GDP, from the OECD Economic Outlook database. The second is the ratio of foreign direct investment flows from the World Development Indicators database. The third is a broader measure of globalisation, the KOF globalisation index compiled by Dreher (2006) and Dreher *et al.* (2008). This index covers several forms of globalisation, namely economic globalisation, social globalisation and political globalisation. We use a sub-index that covers the first two forms.

The data on decentralisation come from the OECD Fiscal Network's Decentralisation database. For comparability of the coefficients of the decentralisation variables with the government size coefficients, decentralisation is measured as local revenue or spending as a share of GDP. The main variables of interest are expenditure and revenue decentralisation. To see the effect of the way in which local expenditure are financed, intergovernmental transfer revenues are controlled for in additional estimates. The revenue decentralisation variable was also broken down into two parts, tax decentralisation and decentralisation of other revenues, with the latter being the difference between tax decentralisation and revenue decentralisation from the OECD Fiscal Network's Decentralisation database.

Results

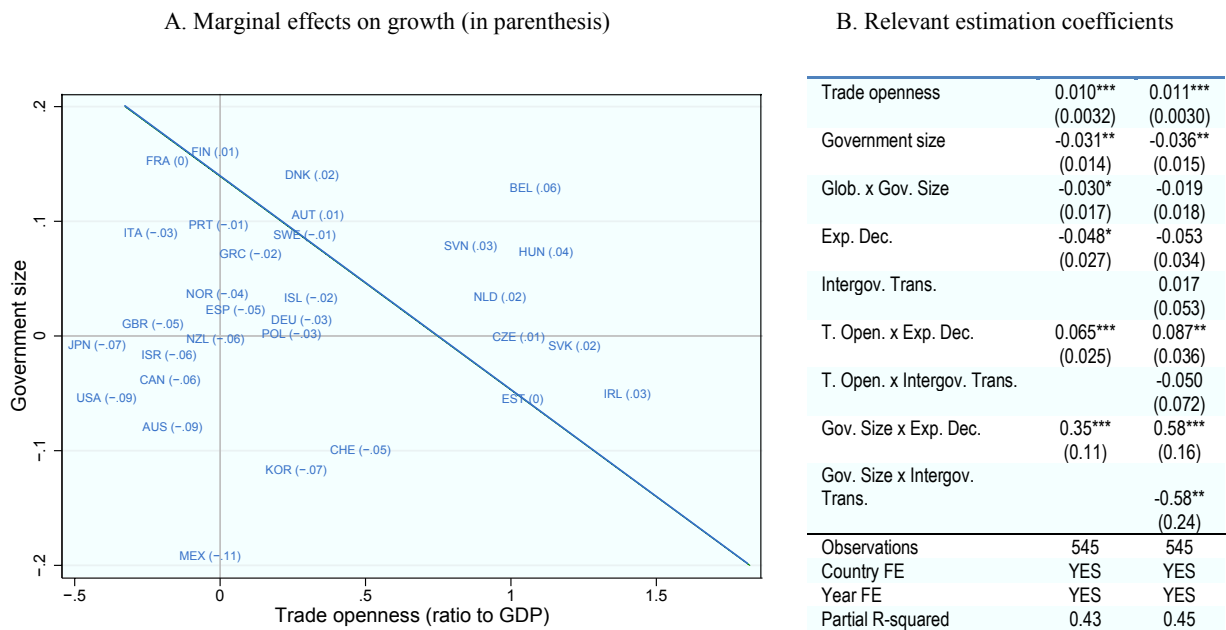
In interpreting the results, we examine growth and inequality effects for spending and revenues in turn, through the channel of government size and globalisation. Given the multiple interactions in the equations and the complexity of interpreting all the interaction terms, we give the most weight to the marginal effects on inclusive growth. The detailed regression estimates for growth effects are shown in Table 3.A1.2, and for inequality in

Table 3.A1.3. We start with an examination of the interactions and country-specific effects for each combination, followed by a summary of the cross-country results, conditional on the degree of globalisation. Note that globalisation as measured with trade openness is found to be most salient for identifying growth effects, while KOF-type globalisation index is found to be more useful in identifying inequality effects. In contrast, the foreign direct investment intensity index is not found to be a strong channel for identifying either growth or inequality effects.

Country-specific growth effects

The first set of results, for spending decentralisation on growth, illustrates the difficulty in drawing broad conclusions on the effects of fiscal decentralisation on growth. Figure 3.2, Panel A, shows that the marginal effects of spending decentralisation on growth vary dramatically across countries, not just in magnitude, but in sign as well. Given their current degree of decentralisation, slightly under half of countries could realise higher growth from a further decentralisation of their spending, while the remainder would benefit from a further *centralisation* of spending. Given the results across the two axes in Panel A, smaller and more open countries benefit the most in terms of growth from further decentralisation.

Figure 3.2. Country-specific effects of spending decentralisation on economic growth



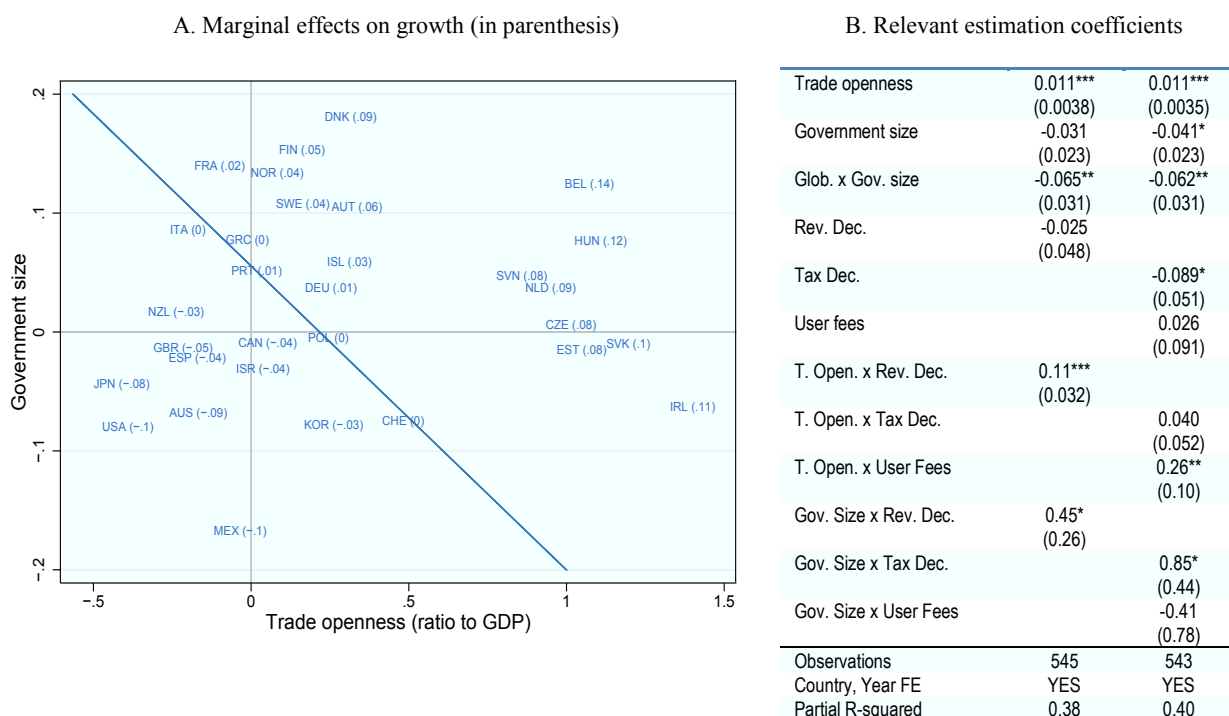
Source: For detailed results, see Table 3.A1.2.

The distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus trade openness. Figure 3.2, Panel B, shows the relevant coefficients from the estimation. Trade openness and government size have the expected (+/-) signs, while the direct effect of spending decentralisation is negative, but this effect becomes insignificant once intergovernmental grants are included. The interaction term between trade openness and spending decentralisation is strongly positive, even more so with grants included, as with government size, comparable with what was found for decentralisation in the previous Chapter 2 by

Blöchliger and Akgun. For the effect on growth, this is even more evident when spending is own-source and not financed through intergovernmental transfers or grants. For those countries that are above the green line in Panel A, the size of the interaction effects of decentralisation with openness more than compensates for the overall negative direct effect of increasing government size on growth. Moreover, the positive effect of spending decentralisation on growth is enhanced the more globalised or open a country is.

The second set of results, for revenue decentralisation on growth, is broadly similar to that of spending. Figure 3.3, Panel A, shows again that the marginal effect of revenue decentralisation on growth varies dramatically across countries, not just in magnitude, but in sign as well. Given their current degree of decentralisation, slightly over half of countries could realise higher growth from a further decentralisation of their revenues, while the remainder would benefit from a further *centralisation* of spending. Given the results across the two axes in Panel A, again, smaller and more open countries benefit the most in terms of growth from further decentralisation.

Figure 3.3. Country-specific effects of revenue decentralisation on economic growth



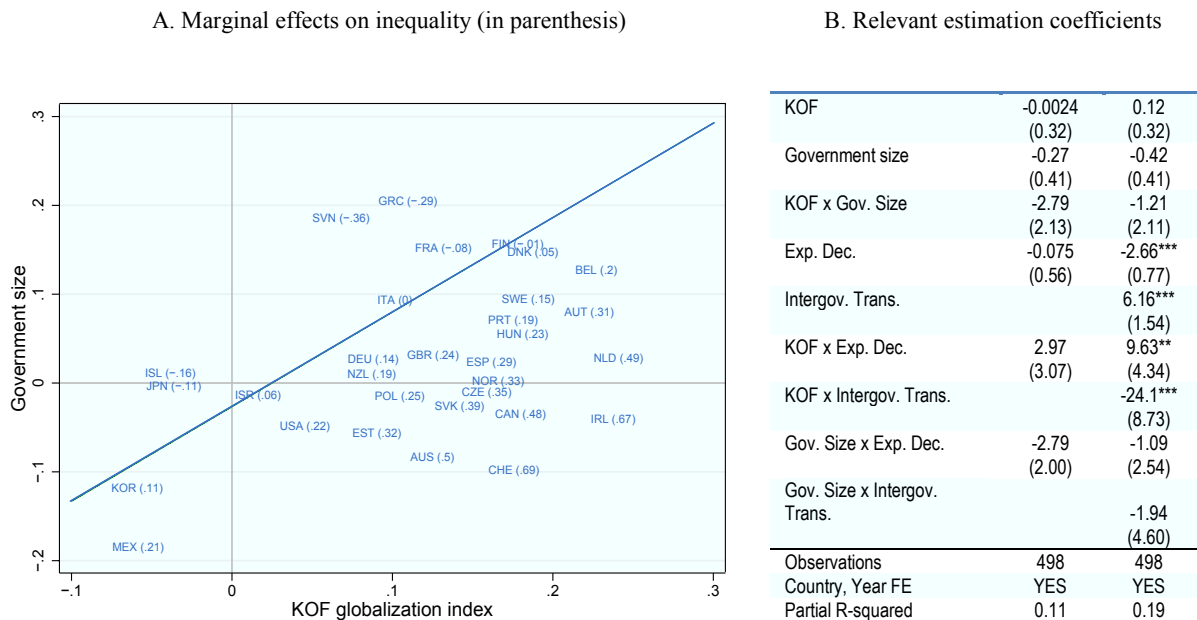
Source: For detailed results, see Table 3.A1.2.

The distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus trade openness. Figure 3.3, Panel B, shows the relevant coefficients from the estimation. Trade openness and government size have the expected (+ / -) signs, while the direct effect of tax revenue decentralisation is only significant (-) once user fees are included. The interaction term between trade openness and revenue decentralisation is strongly positive, but this is primarily driven by the effect of user fees; this is in contrast to the effect via government size, where the effect of tax revenue decentralisation is significantly positive, but driven by the effect of tax revenues rather than user fees. For those countries that are to the right of the green line in Panel A (also above it), the size of the interaction effects of revenue decentralisation with openness more than compensates for the overall negative direct effect of increasing government size on growth. Moreover, the positive effect of revenue decentralisation on growth is enhanced the more globalised or open is a country, and lowered the more closed it is.

Country-specific inequality effects

The third set of results, for spending decentralisation on inequality, contrasts from that for growth. Figure 3.4, Panel A, shows again that the marginal effect of spending decentralisation on inequality varies considerably across countries, in both magnitude and sign. Given their current degree of decentralisation, most countries would experience more inequality (a higher decile ratio) from a further decentralisation of their spending, while the remainder would realize *less* inequality from a further *centralisation* of spending. Given the results across the two axes in Panel A, larger and less globalised countries are best able to mitigate inequality through further spending decentralisation.

Figure 3.4. Country-specific effects of spending decentralisation on inequality (decile ratio)



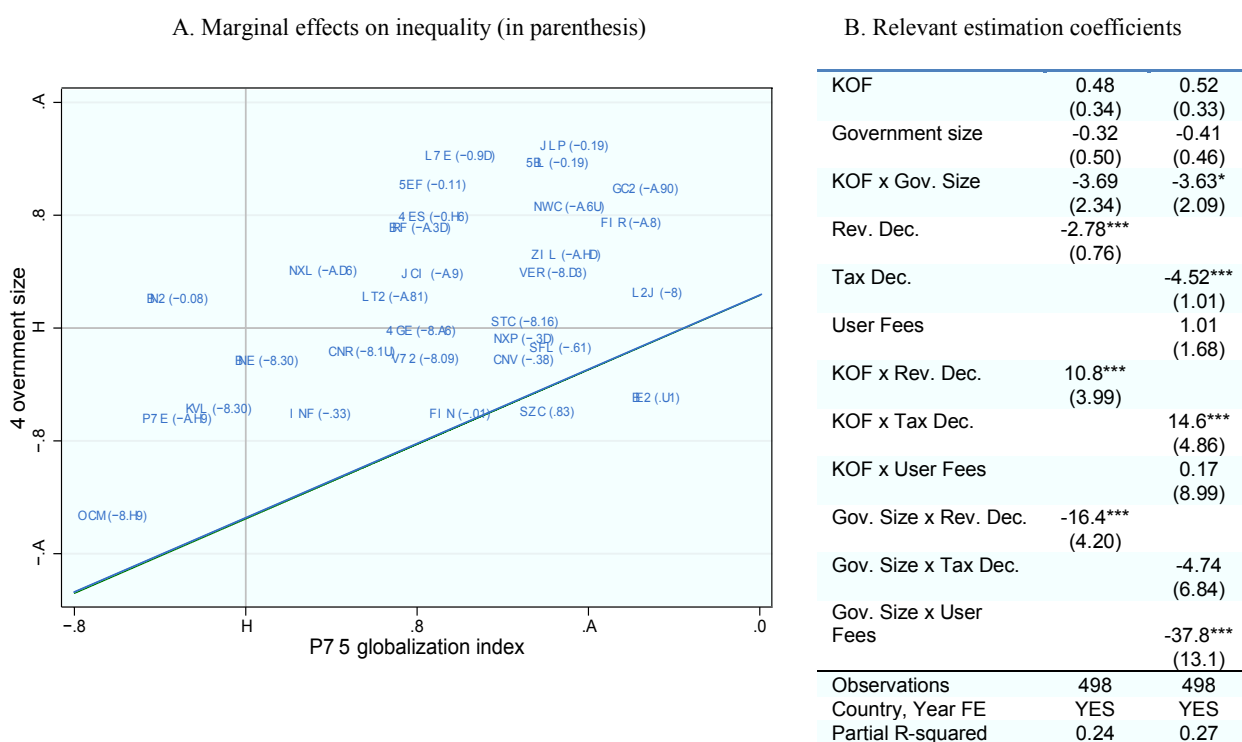
Source: for detailed analytical results, see Table A3.

As with the growth regressions, in the inequality estimates, the distinctions among these marginal effects are primarily determined by the interaction terms between spending and government size plus “KOF-type” globalisation. Figure 3.4, Panel B, shows the most

relevant coefficients from the estimation. Neither KOF globalisation nor government size is significant in their direct effects on inequality; the direct effect of spending decentralisation is only significant once intergovernmental grants are controlled for, in which case spending decentralisation reduces inequality while grants increase it. However, the interaction effects for both types of decentralised spending have the opposite sign, and are larger: the interaction of globalisation with spending decentralisation increases inequality, while that of globalisation with intergovernmental grants decreases it, particularly strongly. The particularly large sign of the latter effect suggests that such grants are likely designed to mitigate inequality that results from globalisation, although they are not large enough to eliminate it. Neither type of spending has a significant interaction with government size in this specification. For those countries that are to the right of the green line in Panel A (also below it), the size of the positive interaction effect of spending decentralisation with globalisation overwhelms the direct negative effect of spending decentralisation on inequality, leading to a higher overall decile ratio. Moreover, the inequality-increasing effect of spending decentralisation is enhanced the more globalised is a country, and mitigated the less globalised it is.

The fourth set of results, for revenue decentralisation on inequality, amplifies the results for spending, and has stronger explanatory power. Figure 3.5, Panel A, shows that the marginal effect of revenue decentralisation on inequality varies considerably across countries, in both magnitude and sign, but this time much more negatively. Given their current degree of decentralisation, most countries would experience *less* inequality (a lower decile ratio) from a further decentralisation of their revenues, while the remaining few would realize more inequality from a further centralisation of revenues. Given the results across the two axes in Panel A, larger and less globalised countries tend to mitigate inequality through further revenue decentralisation, but there are far fewer trade-offs.

Figure 3.5. Country-specific effects of revenue decentralisation on inequality

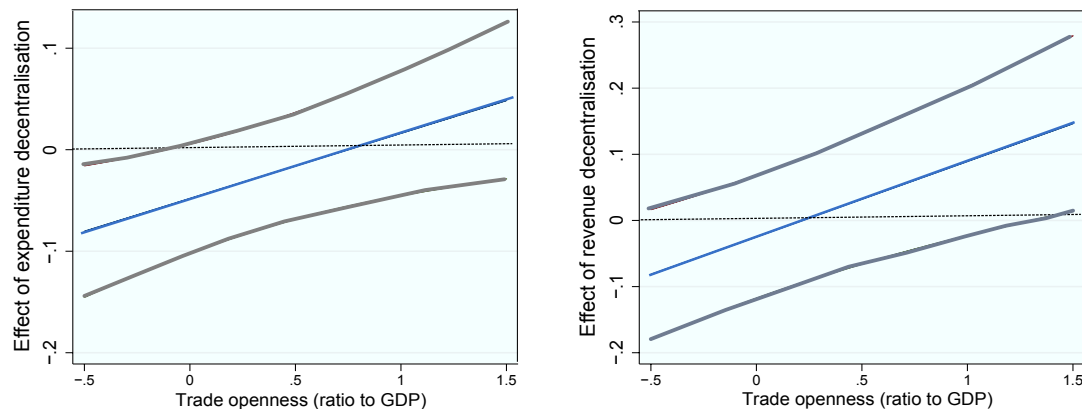


Source: For detailed results, see Table 3.A1.3.

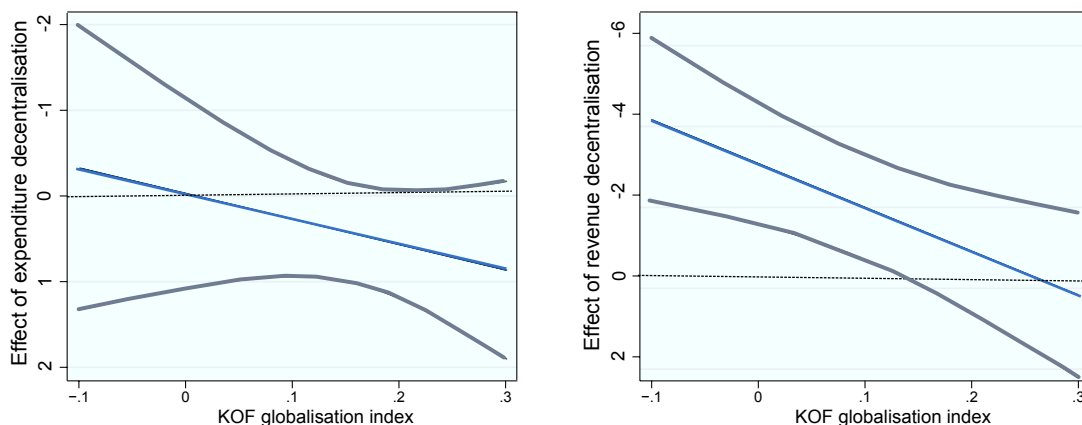
As with the previous regressions, the distinctions among these marginal effects are primarily determined by the interaction terms between revenues and government size plus globalisation. Figure 3.5, Panel B, shows the most relevant coefficients from the estimation. Again, neither KOF globalisation nor government size is significant in their direct effects on inequality; the direct effect of revenue decentralisation is less inequality, with tax revenues driving this effect (*i.e.*, after user fees are separated out). However, the interaction effects of decentralised revenues with both globalisation and government size have the opposite signs, and are larger. The interaction of globalisation with revenue decentralisation increases inequality, a result that is driven by tax revenues (strengthened once user fees are separated out). In contrast, the interaction of government size with revenue decentralisation decreases inequality, a result that is driven heavily by user fees (strengthened once tax revenues are separated out). For those countries that are to the left of/above the blue line in Panel A, the size of the negative interaction effect of revenue decentralisation with government size overwhelms the interaction with globalisation, leading to a lower decile ratio. While revenue decentralisation tends to lead to more inequality the more globalised is a country, the effect is quite modest, and the size of government is more important.

Figure 3.6. **Partial growth and inequality effects of decentralisation, as a function of globalisation**

A. Effect of decentralisation on growth (GDP per capita)



B. Effect of decentralisation on inequality (inverted 90/10 decile ratio)



Notes: Grey lines are 95% confidence intervals around the estimated elasticity (in blue).

Source: For detailed analytical results, see Annex Tables 3.A1.2 and 3.A1.3.

Overall interactions with globalisation

In order to more clearly illustrate how fiscal decentralisation is affected by globalisation in its results on growth and inequality (“inclusive growth”), the partial effects of decentralisation, conditional on the degree of trade openness, are calculated. The results for growth and inequality are shown in Figure 3.6. These effects implicitly hold government size fixed at the sample mean. As shown in Panel A (and described earlier), spending decentralisation is found to boost growth, for countries with a trade openness ratio above the sample average (the mean ratio is 0.7); revenue decentralisation boosts growth for more countries – well over half of the sample – and by a larger amount. For both spending and revenue, increasing decentralisation tends to be more growth-friendly (or at least less growth unfriendly).

For inequality, partial effects of decentralisation are shown in Figure 3.6, Panel B, conditional on the degree of KOF-type globalisation. Spending decentralisation is found to raise the decile ratio, for the sample average (mean KOF index of 0.7), once all interactions are taken into account, and more-so the more globalised is a country. On the other hand, revenue decentralisation tends to decrease the decile ratio, for most countries and more strongly, although less so the more globalised is a country.

Conclusion

Drawing upon new datasets on growth and inequality combined with fiscal decentralisation indicators, this chapter seeks to determine to what extent “inclusive growth” is realisable in a global economic context. Country specificities appear to matter a lot: some countries have already decentralised spending and revenues more than enough, and they would benefit from more centralisation. Other countries are excessively centralised given their fiscal profile, and these would benefit from more decentralisation. Spending and revenue decentralisation tend to boost economic growth for economies that have a relatively higher degree of trade openness, especially if spending is locally financed. On the other hand, fiscal decentralisation has a more ambiguous and potentially negative effect on inequality than on growth, especially for economies with a higher degree of globalisation. Yet, revenue decentralisation is more pro-equity than spending decentralisation in the typical economy’s case. These results appear to be relatively robust, and hold up under a variety of empirical specifications, including with fixed effects and using techniques that seek to address potential endogeneity concerns.

What messages do these results hold for policymakers? The broad pro-growth decentralisation message of the previous chapter is conditioned by concerns about increased inequality, particularly in more globalised economies, where there may be trade-offs in achieving inclusive growth. More careful design of intergovernmental fiscal frameworks is necessary: as recommended in a regional context in Blöchliger et al. (2016), a two-pronged approach can be useful, through a rise in sub-national own-source revenue paired with a re-design of intergovernmental transfers and fiscal equalisation, in order to make all jurisdictions enjoy the benefits of more sub-central fiscal power.

Notes

1. Both authors are affiliated with the OECD Network on Fiscal Relations Across Levels of Government. Special thanks to Robin Boadway, Hansjoerg Blöchlinger, Peter Hoeller, Agnese Sacchi and Christine Wong for comments.
2. Accentuating this mechanism is the role of globalisation in strengthening discipline of sub-national governments' fiscal stances through increased market scrutiny over policies (de Mello, 2005).
3. The results obtained using this method are not reported here to save space. They are available from the authors upon request.
4. To see this suppose that the dynamic relation between a dependent variable y_{it} and two independent variables x_{1it} and x_{2it} is approximated by a simple ARDL(0,1) model as

$$y_{it} = \delta_{01}x_{1it} + \delta_{11}x_{1i,t-1} + \delta_{02}x_{2it} + \delta_{12}x_{2i,t-1} + \theta_{01}x_{1it}x_{2it} + \theta_{11}x_{1i,t-1}x_{2i,t-1}$$

Rearranging the terms to obtain the dynamic multipliers of the variables gives

$$y_{it} = \pi_{1it}x_{1it} + \pi_{2it}x_{2it} - \delta_{11}\Delta x_{1i,t} - \delta_{12}\Delta x_{2i,t} - \theta_{01}x_{1it}x_{2it} - \theta_{11}z_{it} + \varepsilon_{it}$$

where, $\pi_{1it} = \delta_{01} + \delta_{11} + \theta_{01}x_{2it} + \theta_{11}x_{2i,t-1}$, $\pi_{2it} = \delta_{02} + \delta_{12} + \theta_{01}x_{1it} + \theta_{11}x_{1i,t-1}$, and, $z_{it} = x_{1i,t}x_{2i,t-1} + x_{1i,t-1}x_{2i,t} - x_{1i,t-1}x_{2i,t-1}$.

5. The same bandwidth is used by Kao, Chiang and Chen (1999) in a similarly-sized sample.

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Annex 3.A1

Table 3.A1.1 Summary statistics of the main dataset

Variable	Unit	Description	N	Mean	S.D.	Min.	Max.	Source
<i>Income</i>								
Δ ln(GDPPC)	Percentage point	Growth of potential GDP per capita	959	0.02	0.01	-0.01	0.08	Economic Outlook No. 99
ln(GDPPC)	Logarithm	Log. of potential GDP per capita	993	10.56	0.37	8.97	11.69	Economic Outlook No. 99
ln(MHDI)	Logarithm	Average household disposable income	866	9.89	0.34	8.85	10.66	Boarini et al. (2016)
ln(HDIQ1)	Logarithm	Average HDI in first quintile	866	8.95	0.48	7.18	9.73	Boarini et al. (2016)
ln(HDIQ2)	Logarithm	Average HDI in second quintile	866	9.46	0.42	7.87	10.22	Boarini et al. (2016)
ln(HDIQ3)	Logarithm	Average HDI in third quintile	866	9.74	0.39	8.31	10.44	Boarini et al. (2016)
ln(HDIQ4)	Logarithm	Average HDI in fourth quintile	866	10.02	0.36	8.81	10.80	Boarini et al. (2016)
ln(HDIQ5)	Logarithm	Average HDI in fifth quintile	866	10.55	0.31	9.71	11.46	Boarini et al. (2016)
ln(INEQ)	Logarithm	Log. diff. of avg. HDI in 10th and 1st deciles	866	2.08	0.46	1.26	3.51	Boarini et al. (2016)
<i>Government</i>								
GOVEXP	Percentage point	Total government expenditure (ratio to GDP)	1206	0.43	0.09	0.19	0.69	OECD Revenue Statistics
GOVREV	Percentage point	Total government revenue (ratio to GDP)	1230	0.40	0.09	0.17	0.60	OECD Revenue Statistics
EXPDEC	Percentage point	Expenditure decentralisation (ratio to GDP)	607	0.14	0.07	0.03	0.35	OECD Fiscal Dec. Database
TRREV	Percentage point	Inter-governmental transfer rev. (ratio to GDP)	607	0.06	0.04	0.00	0.21	OECD Fiscal Dec. Database
REVDEC	Percentage point	Revenue decentralisation (ratio to GDP)	607	0.09	0.06	0.01	0.23	OECD Fiscal Dec. Database
TAXDEC	Percentage point	Tax decentralisation (ratio to GDP)	1 233	0.05	0.04	0.00	0.17	OECD Fiscal Dec. Database
OTHRDEC	Percentage point	Decentralisation of other revenue (ratio to GDP)	602	0.03	0.02	-0.04	0.08	OECD Fiscal Dec. Database
<i>Globalisation</i>								
OPEN	Percentage point	Total international trade (ratio to GDP)	1 573	0.69	0.46	0.07	3.74	Economic Outlook No. 99
FDI	Percentage point	Total FDI flows (ratio to GDP)	1 250	0.06	0.18	-0.36	4.16	World Development Indicators
KOF	Percentage point	KOF globalisation index	1 408	0.69	0.15	0.25	0.93	Dreher (2006); Dreher et. al (2008)
<i>Control variables</i>								
ln(INV)	Logarithm	Log. investment rate	1 611	-1.45	0.18	-2.15	-0.93	Economic Outlook No. 99
ln(MYS)	Logarithm	Log. mean years of schooling	1 938	2.23	0.33	0.56	2.63	OECD Long Term Database
POPGR	Percentage point	Population growth	1 724	0.01	0.01	-0.01	0.04	Economic Outlook No. 99
UNEMP	Percentage point	Unemployment rate	1 149	0.07	0.04	0.01	0.28	Economic Outlook No. 99
URBAN	Percentage point	Urbanisation ratio	1 904	0.71	0.14	0.28	0.98	World Development Indicators

Table 3.A1.2 Results on growth (GDP per capita)

	Trade openness				FDI flows				KOF globalisation			
Globalisation indicator	0.010*** (0.0032)	0.011*** (0.0030)	0.011*** (0.0038)	0.011*** (0.0035)	0.0028 (0.0042)	0.012** (0.0051)	-0.0024 (0.0063)	-0.0013 (0.0059)	0.050** (0.021)	0.044** (0.021)	0.032 (0.023)	0.042** (0.021)
Government size	-0.031** (0.014)	-0.036** (0.015)	-0.031 (0.023)	-0.041* (0.023)	-0.051*** (0.012)	-0.054*** (0.012)	-0.043** (0.021)	-0.055*** (0.020)	-0.044*** (0.017)	-0.048*** (0.017)	-0.057** (0.027)	-0.071*** (0.025)
Globalisation x gov't size	-0.030* (0.017)	-0.019 (0.018)	-0.065** (0.031)	-0.062** (0.031)	-0.0020 (0.049)	0.0012 (0.047)	0.12* (0.066)	0.095 (0.065)	-0.061 (0.12)	-0.033 (0.13)	0.16 (0.16)	0.16 (0.15)
Expenditure decen.	-0.048* (0.027)	-0.053 (0.034)			-0.018 (0.026)	-0.040 (0.036)			-0.021 (0.035)	-0.041 (0.049)		
Intergov't transfers		0.017 (0.053)				0.038 (0.048)				0.032 (0.078)		
Revenue decen.			-0.025 (0.048)				-0.023 (0.046)				0.014 (0.059)	
Tax decen.				-0.089* (0.051)				-0.067 (0.048)				0.019 (0.075)
User fees				0.026 (0.091)				0.073 (0.093)				-0.069 (0.13)
Globalisation x exp. decen.	0.065*** (0.025)	0.087** (0.036)			0.046 (0.038)	0.30*** (0.094)			-0.0094 (0.15)	0.045 (0.22)		
Glob. x intergov. transfers		-0.050 (0.072)				-0.49*** (0.14)				-0.14 (0.39)		
Glob. x revenue decen.			0.11*** (0.032)				0.100 (0.078)				-0.18 (0.21)	
Glob. x tax decen.				0.040 (0.052)				0.16 (0.11)				-0.68** (0.30)
Glob. x user fees				0.26** (0.10)				-0.021 (0.12)				1.32** (0.65)
Gov't size x exp. decen.	0.35*** (0.11)	0.58*** (0.16)			0.37*** (0.11)	0.64*** (0.14)			0.36*** (0.11)	0.54*** (0.14)		
Gov't size x intergov. trans.		-0.58** (0.24)				-0.75*** (0.21)				-0.52** (0.21)		
Gov't size x rev. decen.			0.45* (0.26)				0.68*** (0.24)				0.46* (0.27)	

Table 3.A1.2 Results on growth (GDP per capita) (cont.)

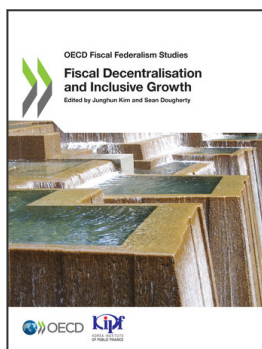
	Trade openness				FDI flows				KOF globalisation			
Gov't size x tax decen.				0.85*				0.92**				0.79*
				(0.44)				(0.39)				(0.42)
Gov't size x user fees				-0.41				0.027				-0.73
				(0.78)				(0.77)				(0.80)
Observations	545	545	545	543	530	530	530	528	518	518	518	518
Country, Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Partial R-squared	0.43	0.45	0.38	0.40	0.39	0.43	0.35	0.35	0.42	0.44	0.36	0.39

Table 3.A1.3 Results on inequality (decile ratio)

	Trade openness				FDI flows				KOF globalisation			
Globalisation indicator	-0.18*** (0.062)	-0.16*** (0.062)	-0.13* (0.071)	-0.11 (0.072)	0.038 (0.031)	0.073** (0.035)	0.081* (0.043)	0.067* (0.037)	-0.0024 (0.32)	0.12 (0.32)	0.48 (0.34)	0.52 (0.33)
Government size	-0.70** (0.31)	-0.64** (0.32)	-0.79** (0.33)	-0.87*** (0.33)	-0.57** (0.24)	-0.46* (0.25)	-0.81*** (0.31)	-0.92*** (0.30)	-0.27 (0.41)	-0.42 (0.41)	-0.32 (0.50)	-0.41 (0.46)
Globalisation x gov't size	-0.100 (0.36)	-0.046 (0.32)	0.085 (0.60)	0.20 (0.59)	-1.24* (0.65)	-1.17* (0.61)	-0.70 (0.48)	-0.85* (0.48)	-2.79 (2.13)	-1.21 (2.11)	-3.69 (2.34)	-3.63* (2.09)
Expenditure decen.	0.22 (0.43)	-1.55** (0.69)			0.55* (0.29)	-0.75 (0.58)			-0.075 (0.56)	-2.66*** (0.77)		
Intergov't transfers		3.52*** (1.15)				2.01*** (0.66)				6.16*** (1.54)		
Revenue decen.			-1.44** (0.66)				-0.48 (0.60)				-2.78*** (0.76)	
Tax decen.				-2.28*** (0.74)				-1.53** (0.60)				-4.52*** (1.01)
User fees				1.09 (1.21)				1.74 (1.07)				1.01 (1.68)
Globalisation x exp. decen.	-0.39 (0.59)	-0.87 (0.72)			0.27 (0.59)	0.85 (0.74)			2.97 (3.07)	9.63** (4.34)		
Glob. x intergov. transfers		-0.65 (1.47)				-1.31 (0.94)				-24.1*** (8.73)		
Glob. x revenue decen.			-0.16 (0.76)				1.88** (0.81)				10.8*** (3.99)	
Glob. x tax decen.				0.14 (1.04)				1.86** (0.86)				14.6*** (4.86)
Glob. x user fees				-1.59 (1.31)				1.12 (2.09)				0.17 (8.99)
Gov't size x exp. decen.	-2.69 (2.21)	-1.39 (2.68)			-2.60 (1.88)	-1.61 (2.43)			-2.79 (2.00)	-1.09 (2.54)		
Gov't size x intergov. trans.		-3.10 (4.69)				-2.11 (4.05)				-1.94 (4.60)		
Gov't size x rev. decen.			-12.6*** (4.06)				-12.8*** (3.72)				-16.4*** (4.20)	

Table 3.A1.3 Results on inequality (decile ratio) (cont.)

	Trade openness				FDI flows				KOF globalisation			
Gov't size x tax decen.				-3.86 (6.37)				-3.37 (5.79)				-4.74 (6.84)
Gov't size x user fees				-31.8*** (11.4)				-32.1*** (11.3)				-37.8*** (13.1)
Observations	523	523	523	521	515	515	515	513	498	498	498	498
Country, Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Partial R-squared	0.13	0.20	0.21	0.24	0.14	0.17	0.19	0.22	0.11	0.19	0.24	0.27



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