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Globalisation and government spending: Evidence for the 'hyper-globalisation' of the 1990s and 2000s

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1 | INTRODUCTION

The 1990s and 2000s were a period of 'hyper-globalisation' (Subramanian & Kessler, 2013), marked by particularly rapid rises in international trade and capital flows.[1] According to many observers, this had a number of benefits, not least much faster rates of convergence across the developing world, particularly from the late 1990s onwards (ibid; see also Abiad et al., 2014; Bourguignon, 2015). Nonetheless, the failure to manage some of the downsides of globalisation has, it is argued, contributed to a growing political backlash against globalisation since the early 2000s (e.g., Rodrik, 2018; Stiglitz, 2018). This has in turn threatened to undermine the benefits of globalisation, through a return to trade protectionism and economic nationalism.

Changes in the level and composition of government spending are one key way in which governments can manage the process of globalisation. According to the 'compensation hypothesis' (Garrett, 1998; Rodrik, 1998), governments respond to globalisation by increasing spending, either as a way of compensating the adversely affected (e.g., workers in import-competing sectors) or, more generally, as a means of offsetting the volatility and insecurity resulting from greater exposure to global markets. Rodrik (1998) found strong empirical support for this hypothesis, in the form of a robust positive relationship between

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[1]The 1990s and 2000s have also been referred to as the period of 'high globalisation' (Milanovic 2016) and 'New Globalisation' (Baldwin 2016:79): roughly speaking, the period beginning with the fall of the Berlin Wall and ending with the start of the global financial crisis. Further details on trends in trade and capital flows in this period are provided in Section 5 below.

openness to trade and government spending in the 1980s and early 1990s, which applied to almost all categories of spending, and was evident among both developed and developing countries.

However, the positive relationship between globalisation and spending may have weakened—or indeed been reversed—during the period of hyper-globalisation, for two reasons. First, the 1990s and 2000s have been characterised by particularly rapid increases in international capital mobility (Chinn & Ito, 2006, 2008; Lane & Milesi-Ferreti, 2007; World Bank, 2002). According to the 'efficiency hypothesis' (Garrett, 2001; Gemmell et al., 2008; Sinn, 2003; Stiglitz, 2002), this process of accelerated financial globalisation may have put pressure on governments to reduce spending, due to a reduction in tax revenues resulting from global competition to attract and retain mobile financial capital. The second reason relates to the changing nature of world trade since the early 1990s, associated with the fragmentation of production across borders—referred to as the 'second unbundling' by Baldwin (2016). This has meant that successful participation in world trade increasingly requires participation in global production networks, often through inward foreign direct investment (FDI), and competition among countries to attract FDI may again put downward pressure on government spending, at least in sectors not considered to be economically productive.[2]

Some prima facie evidence in support of a negative relationship between globalisation and government spending can be found in the fact that the rapid rise in international trade and capital mobility during the 1990s and 2000s has coincided with an aggregate decline in government spending as a share of GDP, as documented further below. However, simple comparisons of aggregate trends should be treated with caution. In this paper, therefore, we provide a detailed empirical assessment of the relationship between globalisation and government spending for the 1990s and 2000s. Two main questions motivate our analysis, namely (a) whether there is any evidence of a weakening or reversal of the positive relationship between globalisation and government spending during the 1990s and 2000s, in comparison with earlier decades, which could help explain the emerging political backlash against globalisation since the early 2000s; and (b) whether any evidence of a negative relationship is stronger for measures of financial globalisation, reflecting the growing international mobility of capital and finance, as opposed to measures of trade globalisation, reflecting the international mobility of goods and services. We also revisit the question as to whether the size or direction of the relationship between trade openness and government spending varies across countries, e.g., between countries more or less exposed to external volatility, as implied by the compensation hypothesis and emphasised by Rodrik (1998).

Our paper contributes to the literature in three main ways. First, we are to our knowledge the first to examine the relationship between globalisation and government spending specifically for the 'hyper-globalisation' period of the 1990s and 2000s, and to compare the evidence for this period with earlier decades. Second, we control more effectively for the potential endogeneity of existing measures of globalisation than has been possible in previous research, by making use of a new set of instrumental variables developed in related empirical work (Dorn et al., 2018; Felbermayr & Gröschl, 2013; Lang & Tavares, 2018). Finally, we assemble a new data set on disaggregated government spending for the period 1990–2016, derived from the IMF Government Financial Statistics (GFS) database, allowing us to extend the analysis beyond the level of overall government consumption expenditure, to more disaggregated components of spending such as health, education and social welfare. This makes our study the first of which we are aware to study the relationship between globalisation and detailed subcategories of spending for the period of the 1990s and 2000s.[3]

[2]See Subramanian and Kessler (2013) on the surge in FDI flows and stocks during the period of hyper-globalisation.

[3]Our data set is freely available for other researchers to use and is available on request from the authors. We have data for slightly more countries for the economic as opposed to functional classification of expenditure (164 compared to 139; we have data for both classifications for 138 countries).

In terms of econometric methods, we use a two-way fixed-effects method with Driscoll–Kraay standard errors (Driscoll & Kraay, 1998) to address cross-sectional dependence, combined with instrumental variable (IV) estimation to account for contemporaneous endogeneity between globalisation and government spending. For spending data, we use government final consumption expenditure from the Penn World Tables (version 9.0), alongside the disaggregated spending data derived from the IMF GFS database. For measures of globalisation, we use the most recent version of the KOF globalisation index (Gygli et al., 2018), focusing specifically on the subindices for trade and financial globalisation, each of which is disaggregated into de facto and de jure components—the former reflecting actual flows of goods and services or capital across countries, and the latter reflecting the extent of government restrictions on such flows. We also make use of two more commonly used globalisation indicators, in particular the trade–GDP ratio (also sourced from the Penn World Tables) and the Chinn–Ito capital account liberalisation index (Chinn & Ito, 2006).

In terms of the results, we find that the 'hyper-globalisation' of the 1990s and 2000s had divergent and conflicting effects on government spending. While de jure trade globalisation tended to raise consumption spending, consistent with the compensation hypothesis, de jure financial globalisation tended to reduce it, consistent with the efficiency hypothesis. We also find evidence of a positive effect of de facto trade globalisation, but which weakened significantly during the 1990s and 2000s compared with the 1970s and 1980s. Our results also confirm the importance of controlling for endogeneity in this context, particularly for the KOF indices of trade globalisation, with large differences in the results between IV estimation and more standard fixed-effects estimation.

The remainder of the paper is organised as follows. Section 2 reviews some of the most recent evidence on the relationship between globalisation and government spending, updating an earlier review by Gemmell et al. (2008). Sections 3 and 4 then outline the methodology and data used in our econometric analysis, while Section 5 provides some initial exploratory analysis of the data. Section 6 then presents our main results, Section 7 our additional results and robustness tests, and Section 8 our conclusions.

2 | LITERATURE REVIEW

Since the seminal contribution by Rodrik (1998), there is now a substantial empirical literature on the globalisation-spending relationship. Gemmell et al. (2008) reviewed 19 studies published between 1995 and 2006, and found that the number finding a positive relationship between openness to trade or capital flows and government spending was broadly balanced by a similar number of studies finding a negative relationship (ibid: 156).[4] In this section, we update the results of Gemmell et al. (2008), by briefly reviewing the results of 13 empirical studies published since 2006.[5]

Basic details about each study are contained in Table 1. In terms of the results, we find a relatively mixed picture, similar to the findings of Gemmell et al. (2008). Turning first to consumption spending, three studies find a consistently positive and statistically significant relationship with trade openness: Epifani and Gancia (2009), Ram (2009) and Shonchoy (2016). However, Benarroch and Pandey (2008, 2012) find no evidence of a statistically significant relationship, while Jetter and Parmeter (2015) find that the results vary depending on the data used: strong evidence of a positive relationship when using

[4]All of the studies reviewed by Gemmell et al (2008) use data up to the late 1990s at the latest.

[5]The review is not designed to be exhaustive; the aim is instead to give a reflection of some of the most recent evidence. For other recent studies looking at the effects of globalisation on government spending, and other dimensions of fiscal policy, see Potrakfe (2015).

TABLE 1 Literature review: cross-country econometric published since 2006

Study	Country sample	Time period	Econometric method	Spending measure (source)	Globalisation measure (source)	Main results[a]
Liberati (2007)	20 OECD countries	1970–2003	OLS, fixed effects, random effects, dynamic panel (Arellano–Bond)	Total spending; total spending excl. interest and defence spending; health, education and social protection spending	Trade openness, FDI, portfolio capital flows (IMF)	−
Shelton (2007)	100 countries	1970–2000 (5-year periods)	Random effects	Total spending, spending by economic classification and by function (IMF).	Trade openness (PWT 6.1).	+
Benarroch and Pandey (2008)	96 countries	1970–2000 (5-year periods)	Fixed effects	Consumption spending (PWT 6.1).	Trade openness (PWT 6.1).	0
Gemmell et al. (2008)	25 OECD countries	1980–97 (annual)	OLS, fixed effects (two-way), error correction model	Total spending, spending by function (OECD, IMF)	Trade openness, FDI stocks (UNCTAD)	Total spending: 0 (trade openness); +/0 (FDI)
Epifani and Gancia (2009)	143 countries	1950–2000 (5-year periods)	OLS, fixed effects	Consumption spending (PWT 6.1); social welfare spending	Trade openness (PWT 6.1)	+ (consumption spending) 0 (social welfare spending)
Kimakova (2009)	87 countries	1980–99 (4-year periods)	Random effects, fixed effects, dynamic panel (Arrelano-Bond)	Consumption spending (PWT 6.1).	Trade openness (PWT 6.1); gross private capital flows	+ (trade openness) + (capital flows)
Ram (2009)	154 countries	1960–2000 (annual, 5 and 10-year periods)	OLS, fixed effects (two-way)	Consumption spending (PWT 6.1).	Trade openness (PWT 6.1).	+

(Continues)

TABLE 1 (Continued)

Study	Country sample	Time period	Econometric method	Spending measure (source)	Globalisation measure (source)	Main results[a]
Benarroch and Pandey (2012)	119 countries	1972–2000 (5-year periods)	Fixed effects (two-way)	Consumption spending (PWT 6.3). Total spending, spending by function (Easterly 2001).	Trade openness (PWT 6.3); financial openness (gross stocks of external liabilities)	0
Meinhard and Potrafke (2012)	186 countries	1970–2004 (5-year periods)	Fixed effects (two-way)	Consumption spending (PWT 6.2)	KOF Globalisation index, aggregate and by component	+ (aggregate, social and political globalisation) 0 (economic globalisation)
Jetter and Parmeter (2015)	Varies, but generally over 100	1960–2010 (annual, 5 and 10-year periods)	Fixed effects (two-way)	Consumption spending (PWT 6.1,7.1,8.0)	Trade openness (PWT 6.1,7.1,8.0)	+ (PWT 6.1) +/0 (PWT 7.1) 0/- (PWT 8.0)
Shonchoy (2016)	97 developing countries	1984–2004 (annual, 3-year periods)	Random effects, FGLS	Consumption spending (WDI).	Trade openness (WDI).	+
Ashraf et al. (2017)	130 countries, developed and developing	2003–11 (annual)	Fixed effects (two-way)	Consumption spending (WDI)	FDI flows, total and disaggregated (UNCTAD)	+ (Greenfield FDI) 0 (M&A FDI)
Kim et al. (2018)	53 OECD and non-OECD countries	1980–2011 (annual)	Fixed effects, DOLS, FMOLS	Total spending (WDI, OECD, IMF)	KOF Globalisation index, aggregate and by component	+ (trade globalisation), - (financial globalisation)

Note: All spending and globalisation measures are expressed as a share of GDP; we do not include studies looking at the composition of government spending (Dreher et al., 2008).

[a]+ indicates a positive and statistically significant relationship, – indicates a negative and statistically significant relationship; 0 indicates no statistically significant relationship;/ implies that results vary.

PWT 6.1 data, but much less evidence when using PWT 7.1, and no evidence when using PWT 8.0 (if anything, a negative relationship). In terms of the other globalisation measures, Kimakova (2009) finds a positive relationship between consumption spending and private capital flows, while Ashraf et al. (2017) find a similar relationship with inward 'greenfield' FDI. However, Meinhard and Potrafke (2012) find no evidence of a significant relationship between consumption spending and the KOF index of economic globalisation (which includes openness to trade and capital flows), although they do find a positive and statistically significant relationship for both social and political globalisation.

The results for other spending measures are also mixed. For total spending, Shelton (2007) finds evidence of a positive relationship with trade openness, but Gemmell et al. (2008) and Benarroch and Pandey (2012) find no evidence of a relationship, while Liberati (2007) finds a negative relationship with openness to trade and capital flows. Kim et al. (2018) find evidence of a positive relationship with the KOF 'trade globalisation' subindex, but a negative relationship with the financial, social and political subindices. When disaggregating spending, Epifani and Gancia (2009) find no consistent evidence of a relationship between trade openness and social security and welfare spending. Benarroch and Pandey (2012) find evidence of a positive relationship between trade openness and education, defence and housing spending among LICs, while Shelton (2007) finds some evidence of a positive relationship between trade openness and education, defence and transport spending. For all other categories of spending, however, these studies find no evidence of a significant relationship with trade openness.[6] Gemmell et al. (2008) also find very little evidence of a relationship between trade openness and disaggregated government spending. However, they do find evidence that the stock of inward FDI significantly increases social welfare, health and general public spending, while it significantly reduces spending on transport, housing, education and economic services.

Finally, there are again mixed results as to whether the positive relationship between trade openness and government spending is stronger among countries, which are more exposed to external risk, as implied by the compensation hypothesis. Rodrik (1998) found positive and statistically significant interaction terms between trade openness and two measures of external risk: the terms of trade volatility and the product concentration of exports. Benarroch and Pandey (2008) also found a positive and significant interaction term between trade openness and terms of trade volatility. However, Epifani and Gancia (2009) find that interaction terms between trade openness and measures of external risk are typically insignificant or negative, contrary to the compensation hypothesis.[7]

To summarise, there remains a wide range of empirical results in the literature, with as yet no apparent consensus. Similar to Gemmell et al. (2008), we find that the number of studies finding a positive relationship between measures of globalisation and government spending is roughly balanced by the number of studies not finding a relationship. Two further points are worth noting. First, there is very little evidence specifically examining the hyper-globalisation period of the 1990s and 2000s. The one exception is Meinhard and Potrafke (2012), who test whether the relationship between KOF globalisation indices and consumption spending differs between the periods 1970–89 and 1990–2004. However, these authors do not distinguish between the trade and financial components of the KOF economic globalisation index, which were found by Kim et al. (2018) to have quite different effects on spending. By contrast, in this paper we not only focus specifically on the 1990s and 2000s, and compare this period with earlier decades, but also disaggregate between the trade and financial components of economic globalisation. Second, none of the studies in Table 1 make use of instrumental

[6]Shelton (2007) also disaggregates spending according to the IMF economic classification and finds some evidence that trade openness increases spending on social transfers, most strongly for OECD countries.

[7]Epifani and Gancia (2009) instead find that the relationship is stronger among countries, which export relatively more differentiated goods, which, they argue, reduces the domestic cost of taxation.

variable (IV) estimation to control for the potential endogeneity of globalisation, instead tending to rely on panel data methods (e.g., fixed effects). As is well known, however, such methods can only control for time-invariant unobserved factors, which may confound the relationship between globalisation and spending.[8] In this paper, we make use of a new set of instrumental variables developed in related empirical work to control for both time-variant and time-invariant confounding factors.

3 | METHODS

We examine the relationship between globalisation and government spending using the following basic equation as a starting point:

$$Expenditure_{it} = \alpha + \beta Glob_{it-1} + \sigma X_{it} + \gamma Year_t + \mu_i + \varepsilon_{it} \quad (1)$$

where $Expenditure$ is a vector of government spending variables, i and t represent country and year, respectively. We estimate this model using annual data, although we also repeat the estimations using 5-year averages as a robustness test. $Glob$ refers to a vector of globalisation variables, which we lag by one year as one part of our strategy for addressing endogeneity concerns (see below); X represents control variables. Year dummy, country dummy and the error term are given as $Year$, μ and ε, respectively. A positive and statistically significant coefficient on the globalisation indices implies evidence of the compensation hypothesis, while a negative and statistically significant coefficient suggests evidence of the efficiency hypothesis. For the main results, all variables are measured in the natural logarithm form, with the exception of the KOF globalisation indices (see below). We estimate Equation (1) using data first for 1990–2014, then for 1970–2014; in the latter case, we include interaction terms between each globalisation and a dummy for the period 1990–2014, to test for differences in the relationship between globalisation and spending in the hyper-globalisation period.

We make use of the two-way fixed-effects estimator. The two-way fixed-effects model helps account for possible biases due to omitted country-specific and time-invariant factors. There are however two main challenges with the typical two-way fixed-effects estimator in our case, namely (a) cross-sectional dependence and (b) contemporaneousendogeneity. Cross-sectional dependence is possible in any panel data as panel groups (countries in our case) are independent, heterogeneous and susceptible to shocks from each other. We account for cross-sectional dependence by using a two-way fixed-effects estimator with Driscoll–Kraay standard errors (DK-SE; see Driscoll & Kraay, 1998).[9] DK-SEs are heteroscedasticity-consistent and robust to general forms of temporal and cross-sectional dependence, and are especially relevant in our case with smaller time dimension.

Further, we acknowledge that there are likely to be causality issues due to contemporaneous endogeneity. More generally, the level of exposure to trade risks is likely to differ between countries due to say geography and differences in government policies (e.g., tariff and non-tariff barriers). In the case of the former, trade partners that are large in nature but located further away from each other are likely to be self-sufficient with lower bilateral trade ratios. For the latter, where countries have high tariff

[8]This mirrors the broader empirical literature on the consequences of globalisation: a neglect of issues of causality and potential reverse causality (Potrakfe 2015). It is worth noting that Rodrik (1998) used IV estimation to extract the exogenous component of trade openness, but in the context of a cross-sectional regression using instruments that varied across countries but were constant over time.

[9]Using the typical two-way fixed-effects estimator, we find evidence of cross-sectional dependence using the Pesaran LM tests (Pesaran, 2004).

and non-tariff barriers to trade, they are likely to have lower exposure to trade. Given that the trade openness measure is a combination of trade and GDP, issues of endogeneity arise which make it difficult to trace the direction of causality (see Rodrik, 1998). We give two examples of endogeneity specific to our paper. First, our sample period covers the global financial crisis, which was associated with a decline in openness to trade in many countries, but also an increase in government spending (due to large fiscal stimulus programmes). Controlling for contemporaneous GDP may not be a sufficient control in this case, since this would not reflect the delayed effects of the crisis on both spending and openness; time fixed effects may also be insufficient, since the crisis affected countries differently and at different points in time. Second, trade liberalisation policies may create endogeneity issues. A cut in tariffs will affect openness but may also have effects on government budgets inducing governments to cut back on government consumption.[10]

To control for potential endogeneity, we construct instrumental variables for each of our globalisation measures following the approaches of Felbermayr and Gröschl (2013), also adopted by Dorn et al. (2018), and Lang and Tavares (); further details are provided in Section 4.3 below. Finally, we include a system-generalised method of moments (GMM) estimator among our robustness checks in Section 7. GMM estimation accounts for persistence in its dynamic expression by including the lag of the dependent variable as an explanatory term (Arellano and Bond, 1991; Blundell and Bond, 1998; Roodman, 2009a, 2009b). Government spending is likely to be persistent: (a) current levels of spending are likely to be dependent on previous levels of spending, and (b) a government spending item (e.g., spending on infrastructure) may be spread over more than one period. Further, GMM partly serves as a robustness check for our IV estimation since we include the lags of the variables as instruments to control for endogeneity.

4 | DATA

In this section, we describe the variables used in the analysis and sources of data. A full list of all variables and definitions, together with the descriptive statistics for each variable, and the correlation matrix, is provided in the Appendix (Tables A1–A3).

4.1 | Government spending

The compensation hypothesis suggests that the relationship between globalisation and government spending should be the strongest for spending in two areas: consumption spending and (particularly in OECD countries) social welfare spending.[11] We concentrate on consumption spending in our main results (Section 5); we then consider social welfare spending, alongside other disaggregated measures of spending in our additional results (Section 6). We proxy consumption spending by the Penn World Table (PWT) government final consumption expenditure measure given its

[10]We are grateful to an anonymous referee for pointing these out.

[11]That is, 'If government spending played a risk-mitigating role, we would expect to see this primarily reflected in income transfer programs and in social security and welfare spending. In most developing countries, income transfer schemes tend to be rudimentary for reasons of administrative capacity. Consequently, their governments tend to rely on public employment, in-kind transfers, and public-works programs— all of which show up in government consumption—in order to broaden safety nets. But in advanced countries with social welfare programs in place, it should be primarily spending on social security and welfare that is correlated with exposure to external risk, not government consumption'. (Rodrik 1998:1019).

advantage over other measures (see Rodrik, 1998; pp. 1001). With regard to the social welfare spending data, we use and report the results for the IMF ECOG classification ('social benefits').[12]

Moreover, given that globalisation may generate pressures for governments to spend more in certain areas, (e.g., 'productive investment': infrastructure to attract mobile capital; see Gemmell et al., 2008), we consider other categories of spending. We follow Oxley and Martin (1991) and categorise spending into pure public goods (general public services plus defence plus public order and safety spending), merit goods (housing and community amenities plus health plus education spending) and economic services (economic affairs plus environment protection plus recreation, culture and religion spending). The effect of globalisation on disaggregated spending is however likely to be dependent on the specific spending type (see Gemmell et al., 2008).

4.2 | Globalisation

We use a range of measures to capture the different aspects of a country's openness that may affect government spending. The first is the KOF globalisation index.[13] This is a composite index, which spans three different dimensions of globalisation (economic, social and political). We focus on the subindices for 'trade globalisation' and 'financial globalisation' (subcategories of the economic dimension), which are designed to measure countries' openness to international trade and capital flows, respectively. According to the compensation hypothesis, greater exposure to international trade implies higher external exposure to external risk and volatility, which in turn generates demands for higher spending. By contrast, greater exposure to international capital flows implies greater pressure on governments to reduce spending, due to lower tax revenues (as suggested by the efficiency hypothesis). Since theory suggests that they may have different effects on spending, we include them separately in our regressions. They are also not that highly correlated: the correlation coefficient is approximately 0.68 in the full sample.

There are fewer grounds in theory for expecting that the other dimensions of globalisation included in the KOF index will affect spending; nonetheless, we still include these as control variables (see Section 4.4 below). We also test separately for the effects of the 'de facto' trade and financial globalisation indices, which reflect actual flows of goods and services or capital that cross national borders, and 'de jure' indices, which reflect the extent of government policies that, in principle, either restrict or enable these flows. These are again not that highly correlated: the correlation coefficient is just 0.29 between the de facto and de jure trade globalisation indices, and 0.44 between the de facto and de jure financial globalisation indices (Table A3). We also use two separate indicators of economic globalisation widely used in the literature, namely the ratio of trade to GDP ('trade openness') from the PWT, which is fairly closely correlated with the de facto trade globalisation index, and the Chinn–Ito index of capital account liberalisation (Chinn & Ito, 2006), which is highly correlated with the de jure financial globalisation index.

[12]This measure of social welfare spending is highly correlated with the alternative IMF COFOG classification ('social protection'); the correlation coefficient is 0.957 in the full sample. Hence, their regression estimates tend to show qualitatively similar results; we report in the text any substantive differences.

[13]The original KOF index was produced by Dreher (2006). The latest version is Gygli et al (2018); this includes data for over 200 countries between 1970 and 2015.

4.3 | Instruments

We construct instrumental variables for each of our globalisation measures. For the four KOF indices (trade and financial globalisation, de facto and de jure globalisation), we follow the approach of Lang and Tavares (2018). For each country and year in our sample, we calculate the one-period lagged, inverse-distance-weighted average KOF index for all other countries, i.e.,

$$KOF\_IV_{it} = \frac{\sum_{j \neq i} d_{ij}^{-1} KOF_{jt-1}}{\sum_{j \neq i} d_{ij}^{-1}} \forall j, i \in I \tag{2}$$

where d_{ij} is the population-weighted distance between all population centres in countries i and j (from Mayer and Zignago 2011), and $i, j \in I$ is the set of countries in our sample. This instrument draws on recent evidence suggesting that the adoption of significant government policy reforms is often spatially correlated, with reforms in one country triggering similar reforms in neighbouring or close-by countries, due to competition, coercion or simple imitation (see, e.g., Fenton Villar, 2020; Simmons et al., 2006; Simmons & Elkins, 2004).[14]

For the trade–GDP ratio, we follow the approach of Felbermayr and Gröschl (2013), which was also adopted by Dorn et al. (2018). This involves predicting bilateral openness using a gravity model within a Poisson pseudo-maximum-likelihood (PPML) estimation framework, with standard errors clustered using country pairs. The procedure involves regressing bilateral trade on exogenous bilateral variables (population) and bilateral geographic variables (contiguity and distance). Other exogenous variables include large-scale natural disasters, and an interaction term between the incidence of natural disasters and international financial remoteness, or land area, or population. The regression includes country and time fixed effects. The sum of the predicted openness values of each country over all the bilateral country pairs is then used as an instrument for trade openness.[15] For the Chinn–Ito index, we use the instrument for the KOF de jure financial globalisation index, on the grounds that the Chinn–Ito index is one important component of this KOF index.

We test for the relevance of our instruments by examining the F-statistics for excluded instruments from each of our first-stage regressions, combined with Kleibergen–Paap and Cragg–Donald tests for under-identification and weak identification.[16] We also test for the endogeneity of our globalisation measures to determine whether IV estimation is required. The results of these tests are contained in Table A4. On the whole, the results of these tests indicate that an IV approach is warranted and that our instruments are relevant. One exception is the KOF indices of de jure financial globalisation and the Chinn–Ito index, where our instruments did not pass the relevance tests. We decided therefore to treat these measures of financial globalisation as exogenous in our regressions, even though without valid instruments, we are unable to rule out endogeneity concerns. The other exception is the trade–GDP ratio, where our instrument passes the relevance test, but there is no evidence of endogeneity, indicating that an IV approach in this case is not warranted.

[14]Note that for the IV regressions, we lag each globalisation measure by one year in our main estimating regression (equation 1 above), so our first-stage regressions involve regressing the one-period lagged value of each globalisation index on the two-period lagged value of the instrument.

[15]Dorn et al. (2018) provide detailed explanation of the instrument used and its construction. The definition of large natural disasters is also provided. Other studies that have used similar instruments for trade openness are Frankel and Romer (1999) and Eppinger and Potrafke (2015).

[16]Note that we are unable to test for instrument exogeneity, as our IV regressions are all exactly identified.

4.4 | Control variables

4.4.1 | Baseline controls

We refer to the control variables in our main results as our baseline controls. These are real GDP per capita, dependency ratio, urbanisation, total population and price ratio.

The Penn World Tables (PWT 9.0) provides data on expenditure-side real GDP at chained PPPs, population and price ratio. We therefore obtain real GDP per capita by dividing the PWT real GDP measure by total population from PWT (for consistency), as in Gemmell et al. (2008) and Benarroch and Pandey (2012). Following Musgrave's (1969) interpretation of Wagner's Law (Wagner, 1983), increases in the levels of GDP per capita are expected to lead to increases in government expenditure as a share of GDP; hence, we expect a positive relationship between real GDP per capita and government consumption spending as a share of GDP. Price ratio from PWT is the ratio of the price level of government consumption to the price level of household consumption. It is a measure of the relative public sector and private sector prices, and an appropriate control for changes in relative prices over time (Gemmell et al. 2008). However, its effect on spending may be positive or negative.

Data on dependency and urbanisation are obtained from the World Bank, World Development Indicators data set (World Bank, 2018). We follow similar studies and use these variables as controls (Benarroch & Pandey, 2008, 2012; Rodrik, 1998; Shelton, 2007). We measure dependency as the sum of the population in the ages 0–14 years and the population in the ages 65+ as a percentage of the total population. An increase in dependency ratio will likely be associated with an increase in demand for higher government consumption spending (since dependents are usually economically inactive and are likely to be reliant on government consumption spending). Hence, we expect a positive relationship between consumption spending and dependency ratio. We measure urbanisation as the urban population as a percentage of total population. We expect government spending on consumption to increase with an increase in urbanisation. The argument here is simple: an increase in urbanisation may create congestion, which is likely to lead to a reduction in the welfare of the citizenry. Such welfare loss may need to be compensated for by increased government spending. Notwithstanding, additional spending on non-rival public goods such as roads and street lighting may decrease with increasing urbanisation due to economies of scale.

With regard to total population, Alesina and Wacziarg (1998) indicate that countries with large population are associated with small government consumption spending as a share of GDP for varying reasons. First, the per capita cost of providing non-rival goods is lower for larger populations (larger economies of scale; see Rodrik, 1998; and Jetter & Parmeter, 2015). In addition, preferences over the provision of public goods are more heterogeneous in larger populations. The net effect therefore depends on the trade-off between the costs associated with greater heterogeneity in preferences and the benefits due to lower per capita cost in public goods provision, although the latter may outweigh the former (see Shelton, 2007). Hence, total population may have a positive or negative effect on spending (Alesina & Wacziarg, 1998; and Rodrik, 1998).

4.4.2 | Additional controls

Our robustness test includes introducing additional controls in Equation (1) to check whether the estimates of the globalisation variables remain consistent in the sign and direction of their effects. These additional controls are in two forms: (a) two measures of potential sources of additional revenue for governments (i.e., external debt stock and foreign aid), and (b) a measure of institutional quality (Polity2).

We obtain data on external debt stock and foreign aid receipts from WDI (2018). External debt stock is external debt stock as a percentage of gross national income, and foreign aid is the net official development assistance (ODA) receipts as a percentage of gross national income (GNI).The idea is that, in the face of limited resources, governments may find external debt (true for both developed and developing countries) and foreign aid (especially true for developing countries) appropriate sources of external inflows to augment domestic revenue shortfalls to finance government activities. Hence, government consumption spending may increase with increases in both external debt stock and foreign aid inflows. However, in the case of foreign aid, while flypaper effects argue that increases in foreign aid receipts lead to more than proportionate increases in consumption spending, aid fungibility arguments suggest increases in foreign aid receipts will be associated with less that proportionate increases in spending, or rather a redistribution of spending. Rodrik (1998) controls for external debt stock, while Shonchoy (2016) controls for foreign aid receipts.

We adopt the Polity2 index from the Polity4 project (Marshall et al., 2014) as a measure of political regime strength. Although other studies generate democracy and autocracy measures from this index (see Shonchoy, 2016), we consider the distinction between democracy and autocracy less relevant in our case since most of the countries in our sample were democratic in the period of our study. We examine the influence of the existing political regime strength on government spending. The argument here is that government spending is likely to vary over a spectrum of political regime strength. Polity2 provides a political regime strength spectrum that ranges from hereditary monarchy to consolidated democracy. Finally, we include the Gini index of market income inequality, taken from the Standardised World Income Inequality Database (SWIID; Solt, 2019). Income inequality is related both to globalisation (e.g., due to the effects of trade openness on the relative returns to skilled and unskilled labour; see, e.g., Anderson, 2005; Dorn et al., 2018) and to government spending (e.g., due to political pressures on governments to engage in more redistributive spending; see, e.g., Meltzer & Richard, 1981; Roine et al., 2009; Gründler & Köllner, 2017; Dorn & Schinke, 2018).[17]

4.4.3 | Interaction terms

To examine whether there is any evidence that the size or direction of the relationship between globalisation and spending varies between advanced countries (OECD countries here) and developing countries (non-OECD countries here), we introduce an interaction term between the globalisation variables and a dummy variable for OECD. We consider OECD countries that existed at the start of the period (i.e., OECD countries in 1990). Our interaction term is similar to Shelton (2007).

We test whether the size or direction of the effect of trade globalisation varies between countries more exposed to external risks, particularly terms of trade shocks. We measure a country's external risk by an interaction between the globalisation variable and the export concentration index. The export concentration (or diversification) index is from the WITS Trade Data. For the missing years, we complement the data by its related measure from the UNCTAD, the concentration index or Hirschman (H) index. It is a measure of the extent to which a country's exports are concentrated (based on a single or few goods) or diversified (based on a lot more goods). It gives an indication as to whether a large share of a country's exports is accounted for by a small number of commodities or vice versa. The index ranges between zero for a country with no exports and 1 for a country with a single export

[17]Note, however, that inequality may also be thought of as a 'mediating' variable, in the sense that at least part of the effect of globalisation on government spending operates through its effect on income inequality. If this is the case, controlling for inequality would lower the estimated effect of globalisation on spending.

commodity. Therefore, the lower the index, the less concentrated (hence more diversified) are a country's exports. Countries that export only a few commodities are more exposed to external risk—in particular to changes in the prices of those commodities on world markets—than countries that export a wide range of commodities. Hence, countries with lower export concentration index face lower external risk, while countries with high concentration index face higher levels of external risk.

4.5 | Sample sizes

For our main estimations, we use two samples: first, a balanced panel of 137 countries over the period 1992–2014 (3,151 observations in total), including 24 OECD countries and 113 non-OECD countries; and second, a slightly smaller panel (again balanced) of 116 countries over period 1972–2014 (4,988 observations), including 24 OECD countries and 92 non-OECD countries. In each case, we lose some observations for regressions including the trade–GDP ratio, the Chinn–Ito index and the export concentration index, due to missing values of these variables (or their instruments).[18] For our results using the disaggregated spending measures, we use samples of between 66 and 97 countries, over the period 1990–2016; the panels in this case are unbalanced, with data for different countries spanning different subperiods.

5 | EXPLORATORY ANALYSIS

Prior to the formal econometric analysis, we carry out some exploratory analysis of the data. We first discuss aggregate trends in globalisation and government spending over time; we then look at trends at the country level, using simple bivariate correlations to establish whether there is any prima facie evidence of the compensation or efficiency hypothesis during the 1990s and 2000s.

Figure 1 shows trends in a range of measures of economic globalisation since 1970. We plot the (unweighted) mean value of each measure over time, for a constant sample of countries.[19] The evidence confirms that the 1990s and 2000s were indeed marked by particularly rapid rises in international trade and capital mobility. The KOF trade globalisation indices (both de facto and de jure) rose gradually during the 1970s and 1980s and then accelerated in the early to mid-1990s, reaching a peak around the time of the global financial crisis in 2008. Similar patterns are observed in the trade openness measure and in the Chinn–Ito index of capital mobility, which both rose rapidly during the 1990s, again reaching a peak in the late 2000s. The one exception is the KOF indices of financial globalisation, which show either a relatively constant increase until the early 2000s before slowing down in the mid-2000s (de facto), or no trend at all (de jure). However, if we disaggregate these indices between OECD and non-OECD countries, we do see a clear acceleration of financial globalisation in the 1990s for non-OECD countries; among OECD countries, the acceleration began slightly earlier, in the 1980s, and reached a peak by the mid-1990s.[20]

[18]Note also that we lose two years of data due to the two-year lag built into our IV approach (see footnote 20). To promote comparability, we also exclude these years from the samples used for the DK-FE estimations.

[19]Note that the samples of countries used to construct Figure 1 are larger than those used for the regression analysis, since data for the dependent variable and all other explanatory variables are not always available.

[20]For the KOF trade globalisation indices and trade openness, the acceleration in the 1990s also mainly reflects trends in non-OECD countries; among OECD countries, the rise is more constant over time, with some evidence of an acceleration only in the 2000s.

Figure 2 shows trends in government spending since 1970. Here, we plot the annual (unweighted) mean value of government consumption spending as a share of GDP, taken from two different sources (the PWT and the WDI), for a constant sample of countries in each case. Here, the overall pattern is almost the reverse of Figure 1: spending rises as a share of GDP during the 1970s and early 1980s, before falling substantially during the late 1980s and 1990s, and then stabilising and recovering slightly during the 2000s. Note that the WDI measure of spending appears to start rising slightly earlier than the PWT measure, although the magnitude of changes over the period is smaller than for the PWT measure. If we disaggregate between OECD and non-OECD countries, the trends are very similar in the 1970s and 1980s, but spending stabilised and began rising again from the late 1990s among OECD countries, as opposed to the mid- to late 2000s among non-OECD countries.[21]

Overall therefore, the evidence in Figures 1 and 2 might be considered to support the 'efficiency hypothesis', in that the rapid rise in international trade and capital mobility during the 1990s and 2000s coincided with an aggregate decline in government consumption spending as a share of GDP.[22] Of course, various other factors might account for the trends shown in Figure 2. Furthermore, there is substantial variation across countries. For example, while the mean rise in the PWT trade openness measure between 1990 and 2008 was 27 percentage points, it rose by less than 10 percentage points in one quarter of countries, and in fact fell in 10% of countries. The interesting question therefore is whether countries experiencing larger increases in trade or financial openness during the period experienced different trends in government spending.

Some initial evidence on this question is shown in Figure 3. Here we plot, for as many countries as possible, the change in each measure of economic globalisation between 1990 and 2008 against the change in government consumption spending as a share of GDP over the same period (from the PWT). The results show no evidence of a significant correlation between changes in government spending and changes in either trade or financial openness, positive or negative. We also tried re-running the scatter plots shown in Figure 3 using other measures of spending: consumption spending from the WDI and social spending from the IMF. We also tried plotting the change in globalisation between 1990 and 1999 against the subsequent change in government spending between 2000 and 2008, thereby allowing for possible lag effects. In each case however, there were again no significant correlations. Overall, the results could therefore be taken to suggest that neither the efficiency nor the compensation hypothesis was significant over this period; trends in government spending were instead driven by other factors. However, these results must be treated with caution, since they fail to control for other possible influences on spending. In the next section therefore, we extend the analysis to more powerful multivariate analysis.

6 | MAIN RESULTS

In this section, we look at the effect of globalisation on government consumption spending, using the PWT data set (version 9.0). Table 2 shows the results for 1992–2014, while Table 3 shows the results for 1972–2014; in each case, columns (1)–(3) show the IV results, while columns (4)–(6) show the DK-FE results. For the IV regressions, our instruments pass the tests for under-identification and weak identification in all cases, but there is clear evidence of endogeneity only for the KOF indices

[21]Note that we were unable to produce a similar graph using the IMF spending data, since these data are more patchy: there are relatively few countries, which provide a complete set of observations over the whole period.

[22]Garett (1998:18) makes a similar point, comparing trends in international trade, capital mobility and government spending in the decade before and after 1985: 'spending growth slowed down at precisely the point when market integration took off'.

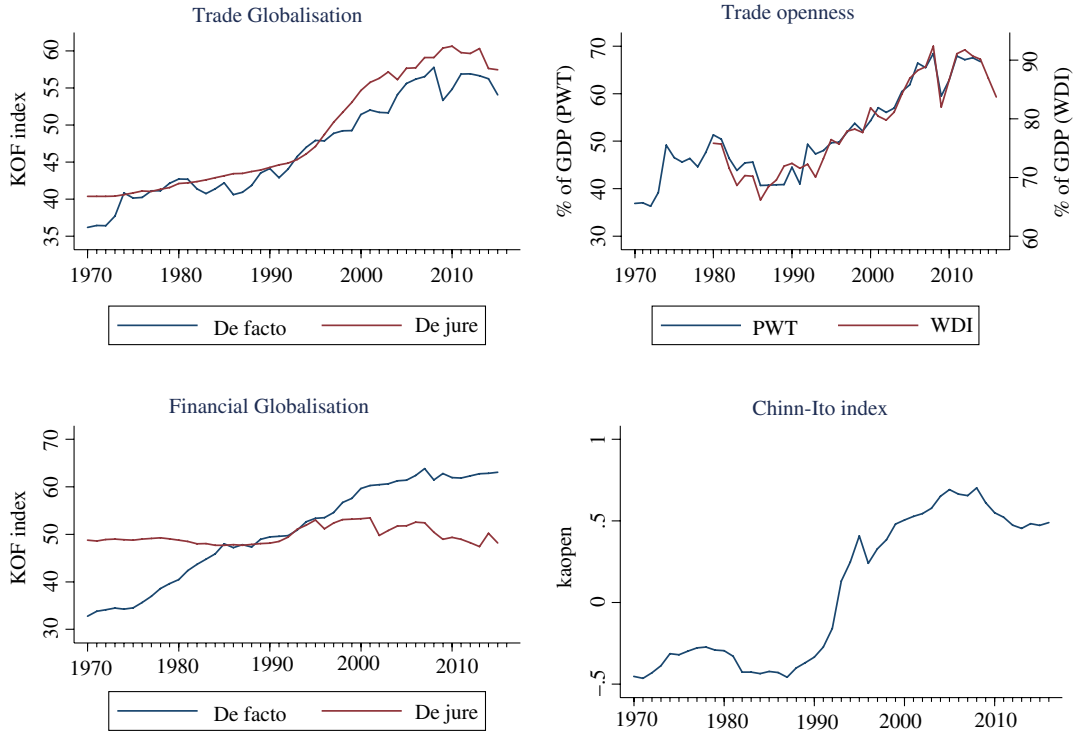

FIGURE 1 Trends in economic globalisation, 1970–2016. *Source*: PWT, KOF, WDI. The sample of countries in each graph is constant over time: 24 OECD and 127 non-OECD countries for the PWT, 24 OECD countries and 97 non-OECD countries for the KOF indices, 21 OECD countries and 71 non-OECD countries for the Chinn–Ito index, and 24 OECD and 93 non-OECD countries for the WDI data. Each included country has a full set of observations over the period shown

(see Appendix Table A4). This means that the IV results in columns (1) and (2) are preferable for the KOF indices, but the DK-FE results in column (6) are preferable for the trade–GDP ratio.

The results in Table 2 show mixed evidence regarding the effects of trade and financial globalisation on government spending during the 1990s and 2000s. On the one hand, we find that de jure trade globalisation had a positive effect, while de jure financial globalisation index had a negative impact. Both of these effects are statistically significant at the 1% level under our preferred approach (IV in this case), and quite large in size: the coefficients in column (2) suggest that a 10-point increase in the de jure trade globalisation index—which corresponds to the median change over the period among our sample of countries—would increase spending by around 17%, while a similar rise in the de jure financial globalisation index would reduce spending by around 8%. These amounts are clearly not trivial, although they might still be swamped by other influences on spending, especially in non-OECD countries where the median absolute deviation in government consumption spending is just under 6% per year. However, we find no evidence that de facto trade or financial globalisation affected government spending, nor the trade–GDP ratio. For the Chinn–Ito index, we do find some evidence of a negative relationship, consistent with the results for the de jure financial globalisation index, but the results are not statistically significant under our preferred approach (DK-FE in this case).

The results for the control variables in Table 2 are somewhat mixed, depending on the estimation method. For the DK-FE results, we observe negative and statistically significant relationships between

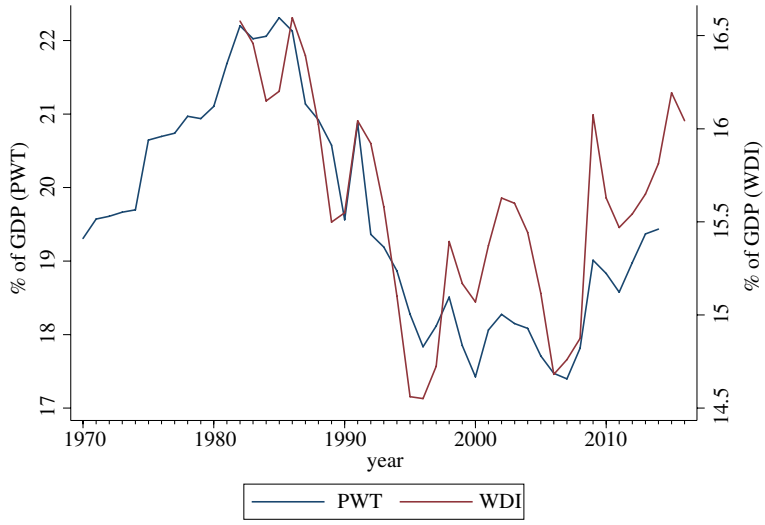

FIGURE 2 Trends in government consumption spending, 1970–2016. *Source*: PWT, WDI. The sample of countries in each case is constant over time: 24 OECD and 127 non-OECD countries for the PWT, and 24 OECD countries and 83 non-OECD countries for the WDI. WDI data for the 1970s are only available for a much smaller number of countries

spending and GDP per capita (thus refuting Wagner's Law), population (supporting the results of Alesina & Wacziarg, 1998), the price ratio of government consumption to household consumption (consistent with Gemmell et al., 2008) and the KOF index of political globalisation. We also find positive and statistically significant relationships for the dependency ratio, urbanisation and the KOF index of social globalisation (consistent with Meinhard & Potrafke, 2012). For the IV results however, the results are statistically significant in much fewer cases, namely the consumption price ratio, the dependency ratio, population and the index of social globalisation, although in only one case do we see a result that is both statistically significant and of the opposite sign across methods (the KOF index of political globalisation).

Turning now to the results for the whole period in Table 3, we find that de facto trade globalisation did have a positive effect on government spending during the 1970s and 1980s, but the effect weakened significantly during the 1990s and 2000s. The coefficients in column (1) imply that a 10-point increase in the de facto trade globalisation index in the 1970s and 1980s would increase spending by 17% (statistically significant at the 1% level), but only by 3% in the 1990s and 2000s; the difference is statistically significant at the 10% level. By contrast, de jure trade globalisation had a slightly larger positive impact on spending in the 1990s and 2000s than in the 1970s and 1980s, with a 10-point increase in the index raising spending by around 12% compared to 8% (column (2)); the difference is statistically significant at the 5% level. We also find that the negative effect of de jure financial globalisation was larger in the 1990s and 2000s than in the 1970s and 1980s, with a 10-point increase in the index reducing spending by 7% compared to 3%; the difference is again statistically significant at the 5% level.

Table 4 shows the results of our tests for possible differences in the relationship between trade openness and government spending across countries. Columns (1)–(3) re-estimate the regressions in Table 2 including interaction terms between each measure of trade globalisation and the export concentration index; columns (4)–(6) then repeat the regressions in Table 3 including interaction terms with a dummy for OECD countries. In each case, we show the results for our preferred estimation

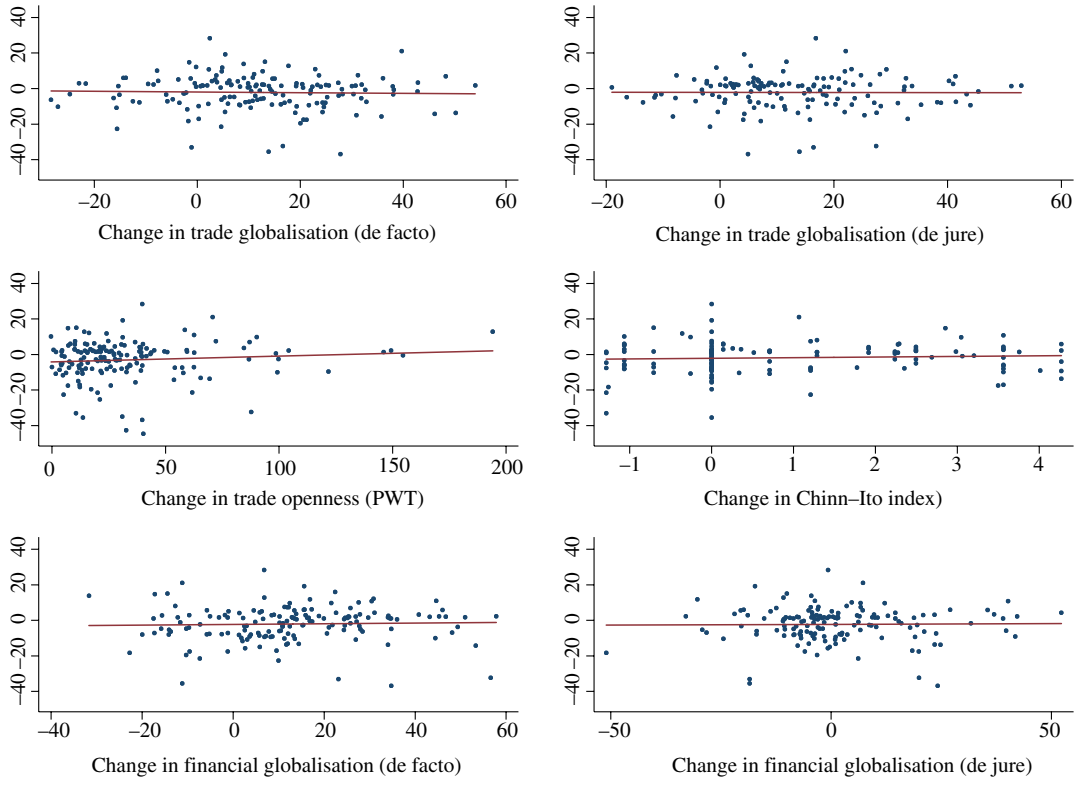

FIGURE 3 Simple correlations between changes in globalisation and changes in government consumption spending, 1990–2008. *Source*: PWT, KOF, Chinn–Ito. The vertical axis in each plot shows the change in government consumption spending as a share of GDP, taken from the PWT database. The number of countries included in each plot varies from 134 to 158. None of the correlations are statistically significant at conventional levels

method only, which remains IV for the KOF indices and DK-FE for the trade–GDP ratio; to economise on space, we also show the results for the variables of interest only. For the KOF indices, there is no evidence of any differences in the relationship between trade openness and spending across countries: none of the interaction terms are statistically significant, although we do still see a positive and statistically significant 'level' effect for the de jure trade index in column (2), and a statistically significant positive but weakening effect for the de facto index in column (4). For the trade–GDP ratio, the interaction with export concentration is again not statistically significant, but we do see significant differences between OECD and non-OECD countries. In particular, the results in column (6) suggest that a 50% increase in the trade–GDP ratio in the 1970s and 1980s would increase spending among OECD countries by 8.5% (statistically significant at the 1% level), compared to 1.1% among non-OECD countries (not statistically significant). The results also suggest that the effect in OECD countries weakened in the 1990s and 2000s, with a similar increase in the trade–GDP ratio raising spending by 6.5% in this period.

In summary therefore, the results in this section suggest that the 'hyper-globalisation' of the 1990s and 2000s had divergent and conflicting effects on government spending. While there is evidence that trade globalisation raised spending, consistent with the compensation hypothesis, financial globalisation appears to have reduced it, consistent with the efficiency hypothesis. However, the results also show that the size and statistical significance of these effects varies across countries and over time, and

TABLE 2 Main regression results, 1992–2014

	IV			DK-FE		
Measures of globalisation	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**
Variables	**1**	**2**	**3**	**4**	**5**	**6**
Trade globalisation	0.007	0.016***	−0.096	−0.001	0.0012*	−0.011
	(0.006)	(0.007)	(0.090)	(0.001)	(0.0005)	(0.016)
Financial globalisation	0.012	−0.008***	−0.038**	2.97E−05	−0.0006	−0.0001
	(0.010)	(0.002)	(0.016)	(0.001)	(0.0007)	(0.006)
GDPpc	0.023	−0.095*	−0.051	−0.130***	−0.126***	−0.130***
	(0.066)	(0.056)	(0.054)	(0.0302)	(0.031)	(0.028)
Dependency	0.664**	0.686***	0.385	0.581***	0.574***	0.533***
	(0.307)	(0.230)	(0.255)	(0.069)	(0.077)	(0.069)
Urbanisation	−0.060	0.125	0.066	0.157**	0.160**	0.131**
	(0.105)	(0.075)	(0.080)	(0.0656)	(0.069)	(0.067)
Population	0.042	−0.066**	−0.022	−0.225***	−0.212***	−0.260***
	(0.043)	(0.031)	(0.025)	(0.0809)	(0.067)	(0.081)
Price ratio	−0.725***	−0.641***	−0.587***	−0.531***	−0.535***	−0.530***
	(0.084)	(0.057)	(0.056)	(0.0344)	(0.036)	(0.034)
KOFSoGI	0.003	0.006	0.015***	0.0132***	0.012***	0.014***
	(0.007)	(0.005)	(0.004)	(0.00211)	(0.003)	(0.002)
KOFPoGI	−0.0004	0.004	−0.0002	−0.002***	−0.002***	−0.002***
	(0.004)	(0.003)	(0.002)	(0.0001)	(0.001)	(0.001)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3,151	3,151	2,332	3,151	3,151	3,049
No. of countries	137	137	127	137	137	135

Note: The IV results are in columns (1)–(3), and the Driscoll and Kraay FE results are in columns (4)–(6). Each set of three columns represents estimations with the de facto globalisation measures, the de jure globalisation measures and the two individual measures of globalisation (i.e., trade–GDP ratio and the Chinn–Ito index), respectively; the dependent variable in each case is the log of government final consumption expenditure as a share of GDP. Robust standard errors in parentheses; ***(**)(*) represent statistical significance at 1%, 5% and 10% levels of significance, respectively. All regressions include a constant term and a full set of year dummies.

TABLE 3 Main regression results, 1972–2014

	IV			DK-FE		
Measures of globalisation	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**
Variables	**1**	**2**	**3**	**4**	**5**	**6**
Trade globalisation	0.016***	0.005	−0.079	−5.62E−05	−0.004***	0.039
	(0.006)	(0.006)	(0.117)	(0.0006)	(0.001)	(0.024)
Financial globalisation	0.011	−0.003	−0.005	−0.0002	0.001	−0.025*
	(0.024)	(0.002)	(0.024)	(0.0006)	(0.001)	(0.015)
Interactions with dummy for 1990s and 2000s:						
Trade globalisation	−0.013*	0.006**	0.039	−0.001	0.006***	0.015
	(0.008)	(0.003)	(0.064)	(0.001)	(0.001)	(0.019)
Financial globalisation	0.004	−0.004**	−0.009	0.001	−0.004***	−0.002
	(0.011)	(0.002)	(0.025)	(0.001)	0.001	0.016
GDPpc	0.069	−0.025	0.012	−0.021	−0.043	−0.009
	(0.066)	(0.068)	(0.065)	(0.042)	(0.042)	(0.047)
Dependency	0.115	0.729***	0.432	0.020	0.054	0.022
	(0.521)	(0.279)	(0.331)	(0.197)	(0.198)	(0.191)
Urbanisation	−0.171	−0.021	−0.063	0.126***	0.124***	0.086**
	(0.153)	(0.064)	(0.068)	(0.034)	(0.031)	(0.037)
Population	0.009	−0.084***	−0.063**	−0.437***	−0.311***	−0.460***
	(0.045)	(0.028)	(0.030)	(0.035)	(0.034)	(0.056)
Price ratio	−0.638***	−0.595***	−0.640***	−0.621***	−0.615***	−0.641***
	(0.075)	(0.051)	(0.060)	(0.020)	(0.018)	(0.021)
KOFSoGI	−0.010	0.003	0.007*	0.012***	0.013***	0.013***
	(0.011)	(0.004)	(0.004)	(0.002)	(0.003)	(0.003)

(Continues)

TABLE 3 (Continued)

	IV			DK-FE		
Measures of globalisation	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**	**KOF de facto**	**KOF de jure**	**Trade–GDP ratio, Chinn–Ito index**
Variables	**1**	**2**	**3**	**4**	**5**	**6**
KOFPoGI	0.007	0.007**	0.006*	−0.001	−0.001	4.71E−05
	(0.006)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	4,988	4,988	3,925	4,988	4,988	4,693
No. of countries	116	116	108	116	116	115

Note: The IV results are in columns (1)–(3), and the Driscoll and Kraay FE results are in columns (4)–(6). Each set of three columns represents estimations with the de facto globalisation measures, the de jure globalisation measures and the two individual measures of globalisation (i.e., trade–GDP ratio and the Chinn–Ito index), respectively;; the dependent variable in each case is the log of government final consumption expenditure as a share of GDP. Robust standard errors in parentheses; ***(**)(*) represent statistical significance at 1%, 5% and 10% levels of significance, respectively. All regressions include a constant term and a full set of year dummies.

TABLE 4 Additional results: trade globalisation interactions with export concentration and OECD dummy

Period	1992–2014			1972–2014		
Estimation method	**IV**	**IV**	**DK-FE**	**IV**	**IV**	**DK-FE**
	KOF de facto	**KOF de jure**	**Trade-GDP ratio**	**KOF de facto**	**KOF de jure**	**Trade-GDP ratio**
Measure of trade globalisation	**1**	**2**	**3**	**4**	**5**	**6**
'Level' effect	0.003	0.014**	0.047	0.014***	0.006	0.028
	(0.009)	(0.007)	(0.033)	(0.005)	(0.007)	(0.023)
Interaction terms:						
Export concentration	0.008	0.004	−0.074	–	–	–
	(0.011)	(0.007)	(0.048)			
OECD countries	–	–	–	0.003	−0.001	0.177***
	–	–	–	(0.005)	(0.003)	(0.028)
1990s and 2000s	–	–	–	−0.009*	0.006	0.017
	–	–	–	(0.005)	(0.006)	(0.020)
OECD countries & 1990s and 2000s	–	–	–	−0.0004	−0.001	−0.065***
				(0.006)	(0.003)	(0.021)
No. of observations	2,445	2,445	2,549	4,988	4,988	4,693
No. of countries	137	137	135	116	116	115

Note: The dependent variable in each case is the log of government final consumption expenditure as a share of GDP; each regression includes all the control variables shown in Tables 2, 3 plus a measure of financial globalisation (KOF de facto, KOF de jure or Chinn–Ito index in columns (1)–(3) and (4)–(6), respectively), a full set of year dummies and a constant term. Robust standard errors in parentheses; ***(**)(*) represent statistical significance at 1%, 5% and 10% levels of significance, respectively.

also depends on the way in which globalisation is defined and measured. The evidence for the 1990s and 2000s applies to the 'policy-based' KOF indices of de jure trade and financial globalisation, and in these cases, the effects on spending appear to be slightly larger during the 1990s and 2000s—more positive and more negative, respectively—than in earlier decades. By contrast, while we do find a positive effect of the 'outcome-based' KOF index of de facto trade globalisation during the 1970s and 1980s, this effect weakened significantly during the 1990s and 2000s. A similar pattern holds when using the trade–GDP ratio, although in the case only among OECD countries. These differences in results between policy-based and outcome-based measures of trade and financial globalisation are not surprising, since the correlation between them is not high (see Section 4.2 above). More surprising, however, is the stronger evidence of a positive relationship between trade openness and government spending among OECD than non-OECD countries. This is in fact the opposite of what we would expect according to the compensation hypothesis, as OECD countries typically have much lower levels of exposure to external risk; the average export concentration index among OECD countries is, e.g., less than half of the average among non-OECD countries.

Two final points regarding our main results are worth mentioning. First, although we find evidence of a negative relationship between the KOF de jure financial globalisation index and government spending, conclusions around causality are more uncertain in this case, due to a lack of adequate instruments for these measures. For trade globalisation however, our results confirm the importance of controlling for endogeneity in this context. As noted above, our results provide significant evidence

of endogeneity for the KOF indices of trade globalisation (both de facto and de jure) and show that controlling for endogeneity using IV estimation makes a large difference to the results for these measures. To give one example, while the DK-FE results in Table 2 suggest that de jure trade globalisation increased spending, the evidence is weaker than for the IV results, and the size of the effect is considerably smaller. To give another, the DK-FE results in Table 3 show no evidence of a relationship between the de facto KOF trade globalisation index and spending, in marked contrast to the IV results.

7 | ADDITIONAL RESULTS

This section contains the results for our robustness tests (Section 7.1) and the other expenditure measures (Section 7.2).

7.1 | Robustness tests

Table 5 summarises the results of our robustness tests. Columns (1)–(2) test for the possible effects of outliers: we first omit very small countries in the sample, defined as those with populations of less than a million (column (1)); we then omit countries with very large changes in either globalisation or government spending during the 1990s and 2000s, defined as changes that lie more than 1.5 interquartile ranges above the 75th percentile or below the 25th percentile (column (2)). Columns (3)–(5) add other potential explanatory variables: institutional quality (column (3)), combined with income inequality (column (4)), and external debt and foreign aid (column (5)). Column (6) adds a quadratic term for each globalisation measure, to allow for a possible non-linear relationship between globalisation and spending; column (7) repeats each regression using data converted into 5-year averages, while columns (8) and (9) repeat the estimates for subsamples of OECD and non-OECD countries. Finally, column (10) shows the results using GMM. For each robustness test, we show the sign and significance of the coefficients found to be statistically significant in Tables 2–4, namely those for the de jure trade globalisation index (from Table 2), the de facto trade globalisation index and its interaction with the dummy for the 1990s and 2000s (from Table 3), and the trade-GDP ratio and its interactions with the dummies for OECD countries and the 1990s and 2000s (from Table 4).

Table 5 suggests that the findings from Section 6 are fairly robust to the exclusion of potential outliers and the inclusion of additional control variables (columns (1)–(6)); the only main exception in this case is the negative coefficient on the interaction between de facto trade globalisation and the dummy for the 1990s and 2000s, which is no longer significant in columns three out of five cases, and the positive coefficient on the de jure trade globalisation index, which is no longer significant in two. The results are also robust to the use of five-year averages rather than annual data. However, the results for the KOF indices of trade globalisation (both de facto and de jure) are no longer significant when adding squared terms for these indices—although in these cases, the squared terms are also not statistically significant, so there is no evidence of non-linearity. The results for the KOF indices are also no longer significant if we estimate separate regressions for OECD and non-OECD countries, except the de jure trade globalisation index, which remains positive for the non-OECD country sample; for the trade–GDP ratio, we still find a positive relationship among the OECD country sample, consistent with our main results, but no evidence of a weakening in the 1990s and 2000s. Finally, when using GMM we still see statistically significant effects of de jure trade and financial globalisation in the 1990s and 2000s (positive and negative, respectively), and a statistically significant weakening of the relationship between trade openness and government spending among OECD countries in the

TABLE 5 Summary of results for robustness tests

	1	2	3	4	5
Robustness test	**No small countries**	**No large changes**	**Controls 1**	**Controls 2**	**Controls 3**
Trade glob. (de facto)	+	+	+	+	+
Trade glob. (de facto) * 1990s and 2000s	−	no	−	no	no
Trade-GDP ratio * OECD countries	+	+	+	+	.
Trade-GDP * OECD * 1990s and 2000s	−	−	−	−	.
Trade glob. (de jure)	+	+	+	no	no
Financial glob. (de jure)	−	−	−	−	−
	6	**7**	**8**	**9**	**10**
	5-year averages	**Non-linear**	**OECD countries**	**Non-OECD countries**	**GMM**
Trade glob. (de facto)	+	no	no	no	no
Trade glob. (de facto) * 1990s and 2000s	−	no	no	no	no
Trade-GDP ratio * OECD countries	+	+	+	.	no
Trade-GDP * OECD * 1990s and 2000s	−	−	no	.	−
Trade glob. (de jure)	+	no	no	+	+
Financial glob. (de jure)	−	−	−	−	−

Note: Here, + (−) (no) refer to positive and statistically significant effect, negative and statistically significant effect and no statistically significant effect, respectively (significance at the 10% level or below in each case); (.) indicates not applicable. Column (3) refers to estimations with institutional quality as the additional control, column (4) refers to estimations with institutional quality and market income inequality, while column (5) refers to estimations with institutional quality, foreign aid and external debt stock as additional controls. Note that column (5) includes data for non-OECD countries only (OECD countries do not have observations for external debt and foreign aid). The results for de facto trade globalisation and the trade–GDP ratio are based on estimations covering period 1972–2014 (cf. Table 3), while those for de jure trade and final globalisation cover the period 1992–2014 (cf. Table 2).

1990s and 2000s, but the other effects are no longer statistically significant. Overall therefore, the main findings from Section 6 are reasonably robust to a range of different samples and specifications, although not entirely so.

7.2 | Other expenditure measures

We show the summary of results for other expenditure measures in Table 6. As noted earlier, in addition to our social welfare measures (i.e., IMF COFOG social protection and IMF ECOG social benefits spending measures, SW COFOG and SW ECOG, respectively), we follow Oxley and Martin (1991) and Saunders (1993) to categorise IMF functional classification of spending into pure public goods, merit goods and economic services. We estimate the results using fixed effects with DK-SEs

and the IV approach. Interestingly, in the IV estimations, none of the globalisation measures is statistically significant.

We begin with the results for pure public goods. From the fixed-effects estimations, we find that the de facto financial globalisation index and the de jure trade globalisation index are positively and significantly associated with government spending on pure public goods. There is a negative and statistically significant relationship between the de jure financial globalisation index and government spending on pure public goods. Turning to economic services, there is a negative and statistically significant relationship between the de facto and the de jure financial globalisation indices, and the Chinn–Ito index and government spending on economic services. All other globalisation variables show no statistically significant effect in the fixed-effects estimation.

Turning to merit goods, the fixed-effects estimation results show the de facto and the de jure trade globalisation indices have a negative and statistically significant link with government spending on merit goods. There is no statistically significant relationship between all other measures of globalisation and government spending on merit goods. From column (5) of Table 6, the fixed-effects estimation results show a negative effect of the de facto trade globalisation index, the de jure trade globalisation index and trade openness on social welfare spending. There is a positive relationship between the de facto financial globalisation index and COFOG social welfare spending. Finally, we turn to ECOG social welfare spending. The fixed-effects estimation results show negative effects of the de facto trade globalisation index and the trade openness variable on the ECOG social welfare spending. There is a positive effect of de facto financial globalisation index on ECOG social welfare spending.

In sum, the effects of the globalisation variables here largely depend on the type of government spending under consideration. What is obvious is that there is more evidence for compensation for pure public goods, while evidence of efficiency occurs more for economic services and spending on merit goods. For government spending on social welfare spending, governments may either opt to compensate for increases in outcomes of actual financial flows or reduce spending on social welfare with increases in actual trade flows or changes in policies that affect actual trade flows.

8 | CONCLUSION

In this paper, we provide an up-to-date empirical assessment of the relationship between economic globalisation and government spending for the hyper-globalisation period of the 1990s and 2000s. We use the most recent available data on government consumption spending from the Penn World Tables, and more disaggregated spending measures from the IMF Government Financial Statistics. We also use the most recent version of the KOF globalisation index (Gygli et al., 2018), alongside a range of more commonly used globalisation measures. Our study is to our knowledge the first to focus specifically on the hyper-globalisation period, and to compare the evidence for this period with the 1970s and 1980s, while at the same time distinguishing between the trade and financial components of economic globalisation, and between de jure (policy-based) and de facto (outcome-based) globalisation. We also control more effectively for the potential endogeneity of measured globalisation than has been possible in previous research, through the use of IV estimation.

We have two main findings. First, we find that the hyper-globalisation of the 1990s and 2000s had divergent and conflicting effects on government spending. While de jure trade globalisation tended to raise consumption spending, de jure financial globalisation tended to reduce it. Second, we find evidence of a positive effect of de facto trade globalisation on spending, but the size of the effect weakened significantly during the 1990s and 2000s compared to the 1970s and 1980s. The positive effect of trade globalisation is consistent with the 'compensation hypothesis', according to which

TABLE 6 Summary of results for other expenditure measure fixed effects with DK-SEs and IV, 1990–2016

	Pure	Services	Merit	SW COFOG	SW ECOG
Fixed effects					
KOFTrdf	No	No	−	−	−
KOFFidf	+	−	No	+	+
KOFTrdj	+	No	−	−	No
KOFFidj	−	−	No	No	No
TO	No	No	No	−	−
Chinn–Ito	No	−	No	No	No
IV					
KOFTrdf	No	No	No	No	No
KOFFidf	No	No	No	No	No
KOFTrdj	No	No	No	No	No
KOFFidj	No	No	No	No	No
TO	No	No	No	No	No
Chinn–Ito	No	No	No	No	No

Note: Summary of results for the globalisation variables using fixed effects with DK-FE SE and IV. Here, + (−) (No) refer to positive effect, negative effect and no effect, respectively. In the SW COFOG estimation, the functional form used (which gives the best results) has the dependent variable measured as share of GDP, dependency ratio as share of total population, urbanisation as share of total population, trade openness as share of GDP, while all other variables are in natural logarithm form except the indices. We use ***(**)(*) representing statistical significance at 1, 5, and 10% levels of significance as the significance criterion.

governments respond to globalisation by increasing spending, as a means of offsetting the volatility and insecurity resulting from greater exposure to global markets. The negative effect of financial globalisation, by contrast, is consistent with the 'efficiency hypothesis', whereby globalisation puts pressure on governments to reduce spending, due, e.g., to pressures on tax revenues resulting from the increasing mobility of capital. Thus, rather than choosing between these two hypotheses, our results provide support for both—once we disaggregate between the trade and financial dimensions of economic globalisation, and between de jure and de facto globalisation—although the strength of the compensation effect appears to have weakened in the 1990s and 2000s.

A number of caveats and qualifications must be noted. First, although we find evidence of a negative relationship between de jure financial globalisation and government spending, conclusions around causality are more difficult in this case, due to a lack of adequate instruments for these measures. This remains one of the limitations of our approach. Second, while our main results are reasonably robust to a range of different samples, specifications and estimation methods, there are some exceptions. Third, while the size of the effects of globalisation on government spending is clearly not trivial, they are not that large given the large variation in levels of spending over time. This suggests the extent of any 'compensation' provided by increased government consumption spending in response to trade globalisation in the 1990s and 2000s has been limited in size, particularly in non-OECD countries where variation in levels of spending over time is greater. In addition, there is no evidence that consumption spending has risen by more in countries, which are particularly prone to external trade risk and which for that reason need compensation most. This suggests that the positive relationship between trade globalisation and consumption spending may be driven by forces other than compensation (see, e.g., Jetter & Parmeter, 2015). Finally, it is interesting to note that the KOF index of social globalisation

in fact has a larger effect on consumption spending than either trade or financial globalisation, across almost all of our estimations. This result is unexpected and merits further investigation in future work (for similar findings on the effect of social globalisation, see Meinhard & Potrafke, 2012).

Notwithstanding these qualifications, our results provide some implications for policy. Our paper was motivated by the evidence of a growing political 'backlash' against globalisation since the early 2000s, which has threatened to undermine the benefits of globalisation, through a return to trade protectionism and economic nationalism. Our results suggest that the combination of rapid trade and financial globalisation, which characterised the hyper-globalisation of the 1990s and 2000s, may have been at least partly to blame. While financial globalisation is unlikely to have been the main driving force behind the declining levels of government spending as a share of GDP shown in Section 5, higher levels of international capital mobility do appear to have offset the ability of governments to provide the compensation required to make the globalisation of trade politically sustainable. To avoid this outcome in future, governments should either proceed more cautiously with financial globalisation, or instead seek to manage the damaging effects of capital mobility through greater steps towards international tax cooperation and coordination.

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REFERENCES

Abiad, A., Prachi, M., & Petia, T. (2014). How does trade evolve in the aftermath of financial crisis? *IMF Economic Review*, *62*(2), 213–247.

Alesina, A., & Wacziarg, R. (1998). Openness, country size and government. *Journal of Public Economics*, *69*(3), 305–321.

Anderson, E. (2005). Openness and inequality in developing countries: A review of theory and evidence. *World Development*, *33*(7), 1045–1063.

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, *58*(2), 277–297.

Ashraf, A., Herzer, D., & Nunnenkamp, P. (2017). Greenfield FDI, cross-border M&As, and government size. *The Journal of International Trade & Economic Development*, *26*(5), 566–584.

Baldwin, R. (2016). *The great convergence*. Harvard University Press.

Benarroch, M., & Pandey, M. (2008). Trade openness and government size. *Economic Letters*, *101*(3), 157–159.

Benarroch, M., & Pandey, M. (2012). The relationship between trade openness and government size: Does disaggregating government expenditure matter? *Journal of Macroeconomics*, *34*(1), 239–252.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143.

Bourguignon, F. (2015). *The globalization of inequality*. Princeton University Press.

Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions and interactions. *Journal of Development Economics*, *81*(1), 163–192.

Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. *Journal of Comparative Policy Analysis*, *10*(3), 309–322.

Dorn, F., Fuest, C., & Potrafke, N. (2018). *Globalization and income inequality revisited* (Ifo Working Paper, No. 247). Ifo Institute – Leibniz Institute for Economic Research at the University of Munich. https://www.econstor.eu/bitstream/10419/176867/1/wp-2018-247-dorn-fuest-potrafke-income-inequality.pdf

Dorn, F., & Schinke, C. (2018). Top income shares in OECD countries: The role of government ideology and globalisation. *The World Economy*, *41*(9), 2491–2527.

Dreher, A., Sturm, J. E., & Ursprung, H. W. (2008). The impact of globalization on the composition of government expenditures: Evidence from panel data. *Public Choice*, *134*(3–4), 263–292.

Driscoll, J. C., & Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *Review of Economics and Statistics*, *80*(4), 549–560.

Epifani, P., & Gancia, G. (2009). Openness, government size and the terms of trade. *The Review of Economic Studies*, *76*(2), 629–668.

Eppinger, P., & Potrafke, N. (2016). Did Globalisation Influence Credit Market Deregulation? *The World Economy*, *39*(3), 426–443.

Felbermayr, G. J., & Gröschl, J. (2013). Natural disasters and the effect of trade on income: A new panel IV approach. *European Economic Review*, *58*, 18–30.

Fenton Villar, P. (2020). The Extractive Industries Transparency Initiative (EITI) and trust in politicians. *Resources Policy*, *68*, 101713.

Frankel, J. A., & Romer, D. H. (1999). Does trade cause growth? *American Economic Review*, *89*(3), 379–399.

Garrett, G. (1998). Shrinking states? Globalization and national autonomy in the OECD. *Oxford Development Studies*, *26*(1), 71–97.

Garrett, G. (2001). Globalization and government spending around the world. *Studies in Comparative International Development*, *35*(4), 3–29.

Gemmell, N., Kneller, R., & Sanz, I. (2008). Foreign investment, international trade and the size and structure of public expenditures. *European Journal of Political Economy*, *24*(1), 151–171.

Gründler, K., & Köllner, S. (2017). Determinants of governmental redistribution: Income distribution, development levels, and the role of perceptions. *Journal of Comparative Economics*, *45*(4), 930–962.

Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2018). The KOF globalization index-revisited. *The Review of International Organizations*, 1–32.

Jetter, M., & Parmeter, C. F. (2015). Trade openness and bigger governments: The role of country size revisited. *European Journal of Political Economy*, *37*, 49–63.

Kim, D. H., Suen, Y. B., Lin, S. C., & Hsieh, J. (2018). Government size, government debt and globalization. *Applied Economics*, *50*(25), 2792–2803.

Kimakova, A. (2009). Government size and openness revisited: The case of financial globalization. *Kyklos*, *62*(3), 394–406.

Lane, P., & Milesi-Ferreti, G. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. *Journal of International Economics*, *73*, 223–250.

Lang, V. F., & Tavares, M. M. (2018). The distribution of gains from globalization (IMF Working Paper, WP/18/54). https://www.researchgate.net/profile/Marina_Tavares/publication/324203332_The_Distribution_of_Gains_from_Globalization/links/5e208b6a458515ba208dce3c/The-Distribution-of-Gains-from-Globalization.pdf

Liberati, P. (2007). Trade openness, capital openness, and government size. *Journal of Public Policy*, *27*(2), 215–247.

Marshall, M. G., Gurr, T. R., & Jaggers, K. (2014). *Political regime characteristics and transitions* (pp. 1800–2013). Centre for Systemic Peace.

Mayer, T., & Zignago, S. (2011). Notes on CEPII's distances measures: The GeoDist database. CEPII, Working Paper, 2011–25(December). Retrieved from https://mpra.ub.uni-muenchen.de/36347/2/MPRA_paper_36347.pdf

Meinhard, S., & Potrafke, N. (2012). The globalization-welfare state nexus reconsidered. *Review of International Economics*, *20*(2), 271–287.

Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. *Journal of Political Economy*, *89*(5), 914–927.

Milanovic, B. (2016). *Global inequality: A new approach for the age of globalization*. Harvard University Press.

Oxley, H., & Martin, J. P. (1991). Controlling government spending and deficits: Trends in the 1980s and prospects for the 1990s. *OECD Economic Studies*, *17*(Autumn), 145–189.

Pesaran, M. H. (2004). *General Diagnostic Tests for Cross Section Dependence in Panels*. University of Cambridge, Faculty of Economics, Cambridge Working Papers in Economics, No. 0435. https://www.econstor.eu/bitstream/10419/18868/1/cesifo1_wp1229.pdf

Potrafke, N. (2015). The evidence on globalisation. *The World Economy*, *38*(3), 509–552.

Ram, R. (2009). Openness, country size, and government size: Additional evidence from a large cross-country panel. *Journal of Public Economics*, *93*(1–2), 213–218.

Rodrik, D. (1998). Why do more open economies have bigger governments? *Journal of Political Economy*, *106*(5), 997–1103.

Rodrik, D. (2018). Populism and the Economics of Globalization. *Journal of International Business Policy*, 1–22.

Roine, J., Vlachos, J., & Waldenström, D. (2009). The long-run determinants of inequality: What can we learn from top income data? *Journal of Public Economics*, *93*(7–8), 974–988.

Roodman, D. (2009a). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, *9*(1), 86–135.

Roodman, D. (2009b). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, *71*(1), 135–158.

Saunders, P. (1993). Recent trends in the size and growth of government in OECD countries. In N. Gemmell (Ed.), *The growth of the public sector*. Edward Elgar Publishing.

Shelton, C. (2007). The size and composition of government expenditure. *Journal of Public Economics*, *91*(11–12), 2230–2260.

Shonchoy, A. S. (2016). Political institutions, governance, and consumption expenditure in developing countries: A panel data analysis. *Contemporary Economic Policy*, *34*(4), 710–728. https://doi.org/10.1111/coep.12162

Simmons, B. A., Dobbin, F., & Garrett, G. (2006). Introduction: The international diffusion of liberalism. *International Organization*, *60*, 781–810. https://doi.org/10.1017/S0020818306060267

Simmons, B. A., & Elkins, Z. (2004). The globalization of liberalization: Policy diffusion in the international political economy. *American Political Science Review*, *98*(1), 171–189. https://doi.org/10.1017/S0003055404001078

Sinn, H. W. (2003). *The new systems competition*. Blackwell.

Solt, F. (2019). Measuring Income inequality across countries and over time: The standardized world income inequality database. SWIID Version 8.2.

Stiglitz, J. E. (2002). *Globalization and its discontents*. Penguin Books.

Stiglitz, J. E. (2018). Where modern macroeconomics went wrong. *Oxford Review of Economic Policy*, *34*(1–2), 70–106.

Subramanian, A., & Kessler, M. (2013). *The hyperglobalization of trade and its future* (Working Paper 13–6). Peterson Institute for International Economics. https://www.dphu.org/uploads/attachements/books/books_3153_0.pdf

Wagner, A. (1893). *Grundlegungderpolitschen okonomie*. C. F. Winter.

World Bank (2002). *Globalisation, growth and poverty: Building an inclusive world economy*. World Bank.

World Bank (2018). *World development indicators*. World Bank.

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APPENDIX

TABLE A1 Variables and definitions

Variable	Definition	Data source
Consumption spending	Government final consumption expenditure as a share of GDP	Penn World Table version 9.0
Social benefits	IMF ECOG social benefits. Includes government spending on social security benefits, social assistance benefits, as well as employment-related social benefits, all in cash and in kind	IMF Government Finance Statistics (GFS, 2018)
Social protection (SW COFOG)	IMF COFOG social protection. This refers to government spending on sicknesses and disability, old age, survivors, family and children, unemployment, housing, other social exclusion, R&D social protection, and other forms of social protection.	IMF Government Finance Statistics (GFS, 2018)
Social benefits (SW ECOG)	IMF ECOG social benefits. This refers to government spending on social security benefits (in case and in kind), social assistance benefits (in cash and in kind) and employment-related social benefits (in cash and in kind)	IMF Government Finance Statistics (GFS, 2018)
Pure public goods	General public services plus defence plus public order and safety spending from IMF COFOG spending	IMF Government Finance Statistics (GFS, 2018)
Merit goods	Housing and community amenities plus health plus education spending from IMF COFOG spending	IMF Government Finance Statistics (GFS, 2018)
Economic services	Economic affairs plus environment protection plus recreation spending from IMF COFOG spending	IMF Government Finance Statistics (GFS, 2018)
Real GDP per capita	Expenditure-side real GDP at chained PPPs divided by total population.	Penn World Tables version 9.0
Dependency	Sum of the proportion of the population in the ages 0–14 years and the proportion of the population in the ages 65+ as percentage of total population	World Bank World Development Indicators (WDI, 2018)
Urbanisation	Urban population as a percentage of total population.	World Bank World Development Indicators (WDI, 2018).
Total population	Total population	Penn World Tables version 9.0
Price ratio	Ratio of price level of government consumption to the price level of household consumption	Penn World Tables version 9.0
KOFTrGIdf	KOF trade globalisation index, de facto	Gygli et al. (2018)
KOFFiGIdf	KOF financial globalisation index, de facto	Gygli et al. (2018)
KOFSoGI	KOF social globalisation index	Gygli et al. (2018)
KOFPoGI	KOF political globalisation index	Gygli et al. (2018)
KOFTrGIdj	KOF trade globalisation index, de jure	Gygli et al. (2018)
KOFFiGIdj	KOF financial globalisation index, de jure	Gygli et al. (2018)
Trade openness	Sum of imports and exports as percentage of GDP	Penn World Tables version 9.0

(Continues)

TABLE A1 (Continued)

Variable	Definition	Data source
Chinn–Ito index	Chinn–Ito index of capital account liberalisation	Chinn and Ito (2006)
Debt stock	External debt stock as a percentage of gross national income (GNI)	World Bank World Development Indicators (WDI, 2018)
Foreign aid	Net official development assistance (ODA) receipts as a percentage of gross national income (GNI)	World Bank World Development Indicators (WDI, 2018)
Polity2	Polity2 index	Polity4 project, Marshall et al. (2014)
Inequality	Gini coefficient of market income inequality	SWIID (Solt, 2019)
Export diversification (or concentration index)	Measure of the extent to which a country's exports are concentrated (based on a single or few goods) or diversified (based on a lot more goods)	WITS Trade Data and UNCTAD Trade Statistics

TABLE A2 Descriptive statistics (1992–2014 sample)

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Spending variables					
Consumption spending	3,151	0.177	0.086	0.017	0.954
Baseline controls					
Real GDP per capita	3,151	14,450	17,515	142	159,826
Dependency	3,151	38.8	7.2	14.1	54.1
Urbanisation	3,151	56.2	23.4	6.3	100.0
Total Population	3,151	43.9	148.0	0.1	1,369.4
Price ratio	3,151	0.985	0.799	0.011	27.346
Globalisation variables					
KOFTrGIdf	3,151	52.7	19.9	3.6	98.6
KOFFiGIdf	3,151	58.5	20.3	10.3	100.0
KOFTrGIdj	3,151	55.0	23.3	7.8	98.9
KOFFiGIdj	3,151	49.3	25.5	1.0	96.1
KOFSoGI	3,151	52.8	20.9	8.9	90.7
KOFPoGI	3,151	65.5	20.2	11.0	99.5
Trade openness	3,151	0.569	0.531	0.013	6.091
Chinn–Ito index	3,061	0.333	1.595	−1.910	2.360
Additional controls					
Debt stock	1,973	68.8	90.1	0.9	1,380.8
Foreign aid	2,228	6.5	10.7	−0.7	192.0
Polity2	2,985	3.8	6.4	−10.0	10.0
Export concentration	2,719	0.323	0.210	0.052	0.961
Instrumental variables					
Ω	2,143	0.661	0.372	0.143	3.402
KOFTrGIdf	3,151	54.2	5.2	39.4	67.9
KOFFiGIdf	3,151	59.3	6.1	43.7	79.4
KOFTrGIdj	3,151	55.3	8.5	35.9	76.5
KOFFiGIdj	3,151	49.8	5.9	37.4	67.6
Other expenditure measures					
Pure public goods	1,296	12.124	27.213	1.923	524.783
Merit goods	1,033	5.586	2.645	0.436	27.111
Economic services	1,296	8.807	3.989	0.352	18.722
Social benefits	1,296	8.554	7.305	0	25.580
Social protection	1,451	8.363	7.498	0	26.013

TABLE A3 Correlation matrix of some variables

Variable	KOFTrGf	KOFFiGf	KOFTrGj	KOFFiGj	KOFSoGI	KOFPoGI
KOFTrGIdf	1.0000					
KOFFiGIdf	0.6004	1.0000				
KOFTrGIdj	0.2651	0.5771	1.0000			
KOFFiGIdj	0.1613	0.4988	0.6243	1.0000		
KOFSoGI	0.3423	0.6417	0.8313	0.6569	1.0000	
KOFPoGI	−0.0853	0.2268	0.4474	0.3427	0.5569	1.0000

Variable	Chinn–Ito index	Trade openness
Chinn–Ito index	1.0000	
Trade openness	0.4250	1.0000

Variable	Social benefits	Social protection	Consumption
Social benefits	1		
Social protection	0.9515	1	
Consumption	0.5098	0.4795	1

TABLE A4 Test statistics for IV estimations: Main results

1992–2014 (Table 2)						
	1		**2**		**3**	
K-P(under)	12.8 (0.00)		19.7 (0.00)		10.0 (0.00)	
C-D(weak)	62.9		295.2		888.8	
Endog. test	16.97 (0.00)		4.4 (0.04)		1.7 (0.19)	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	20.7 (0.00)	10.5 (0.00)	24.7 (0.00)	-	65.5 (0.00)	-
S-W *F* test	18.7 (0.00)	13.3 (0.00)	24.7 (0.00)	-	65.5 (0.00)	-

1972–2014 (Table 3)						
	1		**2**		**3**	
K-P(under)	3.0 (0.08)		15.1 (0.00)		9.9 (0.00)	
C-D(weak)	16.0		243.2		669.3	
Endog. test	11.6 (0.02)		1.1 (0.57)		1.9 (0.38)	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	12.5 (0.00)	6.6 (0.00)	11.5 (0.00)	72.4 (0.00)	43.5 (0.00)	25.3 (0.00)
S-W *F* test	28.3 (0.00)	4.2 (0.04)	22.5 (0.00)	141.1 (0.00)	93.4 (0.00)	60.2 (0.00)
	(c)	(d)				
F-stat excl	9.3 (0.00)	23.3 (0.00)				
S-W *F* test	20.3 (0.00)	7.4 (0.01)				

Note: Each set of three columns represents estimations with the de facto globalisation measures, the de jure globalisation measures and the two individual measures of globalisation (i.e., trade–GDP ratio and the Chinn–Ito index), respectively. The columns marked (a), (b), etc show the results of excluded instruments from the first-stage regressions; note that the de jure index of financial globalisation and the Chinn–Ito index are assumed exogenous.

TABLE A5 Test statistics for IV estimations: Other expenditures

Pure goods						
	1		**2**		**3**	
K-P(under)	1.895 (0.169)		0.124 (0.725)		1.194 (0.2744)	
C-D(weak)	7.265		0.696		4.008	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	16.04 (0.000)	5.44 (0.006)	1.00 (0.371)	2.10 (0.128)	7,366 (0.000)	8.13 (0.001)
S-W *F* test	1.80 (0.183)	1.90 (0.171)	0.12 (0.729)	0.13 (0.715)	1.20 (0.276)	1.28 (0.262)
Economic services						
	1		2		3	
K-P(under)	3.244 (0.007)		0.589 (0.443)		0.026 (0.872)	
C-D(weak)	11.868		2.04		0.08	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	13.18 (0.000)	2.83 (0.065)	0.41 (0.666)	0.98 (0.382)	88.39 (0.000)	5.07 (0.009)
S-W *F* test	8.73 (0.004)	3.58 (0.062)	0.74 (0.392)	1.80 (0.184)	0.02 (0.876)	0.02 (0.876)
Merit goods						
	1		2		3	
K-P(under)	1.895 (0.169)		0.124 (0.725)		1.194 (0.274)	
C-D(weak)	7.265		0.696		4.008	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	16.04 (0.000)	5.44 (0.006)	1.00 (0.371)	2.10 (0.128)	73.66 (0.000)	8.13 (0.001)
S-W *F* test	1.80 (0.183)	1.90 (0.171)	0.12 (0.729)	0.13 (0.715)	1.20 (0.276)	1.28 (0.262)
SW COFOG						
	1		2		3	
K-P(under)	3.878 (0.049)		1.044 (0.307)		0.749 (0.387)	
C-D(weak)	12.935		5.803		4.15	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	17.13 (0.000)	9.18 (0.000)	2.93 (0.058)	1.83 (0.165)	95.08 (0.000)	1.04 (0.359)
S-W *F* test	3.91 (0.051)	4.44 (0.038)	1.75 (0.189)	1.17 (0.282)	1.74 (0.190)	0.76 (0.385)
SW ECOG						
	1		2		3	
K-P(under)	1.895 (0.169)		0.124 (0.725)		1.194 (0.274)	
C-D(weak)	7.265		0.696		4.008	
	(a)	(b)	(a)	(b)	(a)	(b)
F-stat excl	16.04 (0.000)	5.44 (0.006)	1.00 (0.371)	2.10 (0.128)	73.66 (0.000)	8.13 (0.001)
S-W *F* test	1.88 (0.183)	1.90 (0.171)	0.12 (0.729)	0.13 (0.715)	1.20 (0.276)	1.28(0.262)

Note: Each set of three columns represents estimations with the de facto globalisation measures, the de jure globalisation measures and the two individual measures of globalisation (i.e., trade–GDP ratio and the Chinn–Ito index), respectively.