

Martín-Mayoral, Fernando; Sastre, Juan Fernández

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Determinants of social spending in Latin America during and after the Washington consensus: a dynamic panel error-correction model analysis

Fernando Martín-Mayoral¹  · Juan Fernández Sastre¹

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Abstract This paper examines the determinants of social spending in Latin America during the period 1990–2012 and how they differed between the years of the Washington Consensus (1990–2000) and the period that followed (2001–2012). Special attention is also paid to the evaluation of convergence towards a common upper-bounded steady state (absolute beta convergence) or to specific steady states conditioned by their country's specific determinants (conditional beta convergence). We estimate a panel error-correction version of an autoregressive distributed lag model to identify the long-term relationships between social expenditure and its determinants. Generalised methods of moments estimators are used to control the endogeneity of the regressors. Results indicate that Latin American social spending follows a conditional beta convergence process over the Washington consensus period that was mainly driven by structural differences in fiscal burdens and external debt, while during the second period it was explained by conjunctural differences in the fiscal burden, GDP per capita and the growth of trade and capital openness.

Keywords Social spending · Latin America · Beta convergence · Washington consensus · Dynamic panel error-correction model · GMM estimators

JEL Classification E6 · H5 · I3

✉ Fernando Martín-Mayoral
fmartin@flacso.edu.ec
Juan Fernández Sastre
jfernandez@flacso.edu.ec

¹ FLACSO Ecuador, Departamento de Desarrollo, Ambiente y Territorio, La Pradera E7-174 y Av. Diego de Almagro, Quito, Ecuador

1 Introduction

The reduction of poverty and inequality as well as the promotion of human performance and capabilities has become of increasing interest in the economic development debate (Sen 1982). At the same time, improving education, health, sanitation and other social services has become a priority for the governments (Suescún 2007). In this context, two separate questions have attracted the interest of policymakers and researchers. The first is related to the effectiveness of social policies in terms of providing access to education among low-income groups, the creation of employment opportunities or the social protection of certain excluded population sectors (United Nations Economic Commission for Latin America and the Caribbean 2012). The second deals with the analysis of the determinants of social expenditure levels and their growth, as they have a direct influence on human development. This paper belongs to the second group of studies, as it examines the factors that influence convergence in social spending across 17 Latin American countries for the period 1990–2012.¹

A large number of studies have attributed the restructuring of the welfare state to the growth of globalisation. On one hand, there is the pessimistic view that welfare provision would converge to a new low-level social expenditure equilibrium, because of globalisation and increasing economic vulnerability, and capital outflows, irrespective of ideology (Strange 1996; Friedman 2000; Swank 2001). On the optimistic side, Boix (1998) stresses that globalisation allows leftist parties to expand their activities in human capital formation, expanding the welfare state more than right-wing parties do. Consequently, divergence in welfare effort is more likely to continue (Kitter and Obinger 2003). Pierson (2001) supports a third view, called “the politics of blame avoidance”, since efforts to scale down the welfare state involve high risks of electoral punishment. Therefore, he argues that partisan differences will disappear, and governments will attempt to renegotiate and restructure the welfare state under pressure from international competition. In the long run, however, welfare states may become more like each other, since all the nations are anxious to make their welfare systems more competitive, although the ways in which these adjustments are accomplished differ from country to country (Kitter and Obinger 2003, 22), depending on their institutional legacies. Kitter and Obinger (2003), following Flora (1986), describe a natural process of saturation and therefore convergence to the long-term equilibrium of an upper-limit welfare state. They accept the catch-up hypothesis across OECD countries, where the social effort path is dependent upon past spending levels. Behind this idea lies the assumption of an absolute beta

¹ The ECLAC dataset covers the period 1990–2014. However, we have excluded from the analysis the four Caribbean countries for which the ECLAC does not provide information (Cuba, Jamaica, the Dominican Republic and Trinidad and Tobago). We also decided to exclude the data for 2013 and 2014, because few countries have provided information about social expenditures (Argentina, Chile, Costa Rica, Guatemala and Nicaragua).

convergence to a common upper level of social expenditure, thereby confirming the saturation effect.²

Püss et al. (2005) find the presence of statistically significant beta convergence for total and per capita social expenditure at purchasing power parity (PPP) as a share of GDP for EU countries over the period 1993–2000. Starke et al. (2008) find beta convergence in 21 OECD countries from 1980 to 2003, which reveals an upward trend over time. Even so, they observe a quite modest reduction of disparities between countries, i.e. a lack of sigma convergence. For Latin American countries, Lora (2009) gives an interpretation of the convergence coefficient stating that social expenditure has a certain inertia.

We agree in part with the catch-up or beta convergence hypothesis to an upper-limit social expenditure equilibrium. However, the discrete reduction in dispersion across countries (see Table 5 in Appendix) indicates that perhaps Latin American countries are not converging to a common upper-bounded steady state in social effort. Instead, these results might be interpreted as evidence of conditional beta convergence, where each country is converging to its own steady state in social effort, which is consistent with the persistence of disparities across countries. In social expenditure growth, these are determined by economic, demographic and political differences across Latin American countries. In this regard, it is important to note that social spending as a state policy in Latin America during 1990–2012 can be divided into two clearly differentiated periods that could have affected the influence of its economic, demographic and political determinants.

During the first period, covering the years 1990–2000, with the implementation of the Washington consensus, most Latin American governments carried out deep structural and institutional reforms that were mainly focused on budgetary discipline. These reforms encompassed policies in areas such as macroeconomic stabilization, economic opportunities with respect to both trade and investment, and the expansion of market forces within the domestic economy. During these years, the role of the state was weakened in Latin American countries and social spending was highly conditioned to fiscal discipline and debt repayment. Leaving aside the macroeconomic consequences of the Washington consensus, its logic was progressively abandoned after 2000 (Lora 2001) and the social agenda occupied a much more prominent place during these years. In general terms, the Washington post-consensus favoured the defence of the complementary (and not exclusive) relationship between the market and the state, the strengthening of institutional capacities, the implementation of reforms focused on social issues and the recovery of public activities as a development factor. Consequently, the role of the States in the provision of social services was strengthened, incorporating in their social policies concepts such as the protection of rights, full citizenship and social inclusion (Tomber 2016). Efforts to extend population coverage in social protection, with a better quality and a wider variety of social services were central to almost all countries in the region (Cecchini et al. 2014). To achieve these targets, fiscal

² However, other studies from developing countries, have found that globalisation is not powerful enough to change the national policies, not contributing them to converge toward a long-term common equilibrium (Bouget 2003, Saint-Arnaud and Bernard 2003, Starke et al. 2008).

revenue had to be increased to strengthen the social services that contributed to the expansion of opportunities for the poor (Kuczynski and Williamson 2003). In addition, the majority of Latin American and Caribbean states began to undertake counter-cyclical measures to stabilize employment, economic activity and social vulnerability. The 2008 financial crisis deepened this change of direction (United Nations Economic Commission for Latin America and the Caribbean 2011). Roughly, we can state that during this period, governments paid less attention to structural fiscal factors and the evolution of social expenditure was more linked to conjunctural factors.

Given that the role of the state was clearly different between these periods, it is likely that the economic, demographic and political factors that influence social spending growth also differed. The aim of this study is precisely to evaluate which determinants explained differences in social spending growth during the years of the Washington Consensus (1990–2000) and the period that followed (2001–2012). Additionally, we will analyse whether social spending in Latin America converged towards a common upper-bounded steady state or to specific steady states conditioned by their country-specific characteristics. The rest of the paper is organised as follows: Sect. 2 reviews the literature on the determinants of social spending in developing and transition countries. Section 3 addresses the main methodological issues highlighted in the literature and presents the methodology used in this paper. Section 4 displays and discusses the results on the determinants of social spending and its categories. Finally, we conclude in Sect. 4.

2 Determinants of social spending

Studies on the determinants of social spending have increased since the late 1970s, coinciding with the implementation of social policy reforms carried out in developed countries to strengthen their welfare states (Kittel and Obinger 2003). Several determinants of social spending were considered, such as the ideological orientation of governments, integration into global markets or the degree of fiscal decentralisation.³ Since 2000, there has been a rising interest in analysing these issues in developing and transition economies, given the dynamics and peculiarities of their economic, political, institutional and demographic characteristics. In what follows, we review the literature on the economic, demographic and political determinants of social spending that focuses on Latin American countries.

2.1 Economic determinants of social spending

From an economic perspective, the literature has focused on globalisation as one of the main determinants of social spending (Kaufman and Segura-Ubiergo 2001; Avelino et al. 2005; Dreher et al. 2008; Leibrecht et al. 2011). There are two opposing views on the effect of globalisation on social spending: the efficiency hypothesis and the compensation hypothesis (Garrett 1998; Garrett and Nickerson

³ See Snyder and Yackovlev (2000) for a detailed review of studies for this period.

2001). On one hand, the efficiency hypothesis considers that globalisation imposes pressure on governments that favours market interests over social issues, thus reducing social expenditures.⁴ Kaufman and Segura-Ubiergo (2001) find that there is a negative impact of trade openness on the various types of social expenditure. Garrett and Mitchell (2001) in their study of 18 OECD countries also find that trade openness reduces social security spending.

On the other hand, the compensation hypothesis argues that integration into international markets would encourage governments to increase social spending to boost workers' productivity and overcome greater volatility and risk. Kaufman and Segura-Ubiergo (2001: 557) observe that the increase in international competition may cause "social dislocation, uncertainty and unequal distributive effects". Bearing in mind that public investment in human capital represents a public good, the business sector may also demand greater investment in education, which should help them to enhance productivity and thereby improve their competitiveness. In this scenario, governments would see benefit in increasing social expenditure to avoid political instability, thus redistributing the risks of the increased openness of the economy. Furthermore, financial openness should theoretically follow a similar logic, as businesses conducting foreign direct investment value the contribution of social expenditure through the increase in education and health standards (Görg et al. 2008). Several studies have found a positive effect on trade and capital openness and public spending (Hicks and Swank 1992; Huber et al. 1993; Quinn 1997; Bernauer and Achini 2000; Swank 2001; Balle and Vaidya 2002; Bretschger and Hettich 2002 as cited by Gemmell et al. 2008). Kaufman and Segura-Ubiergo (2001) also find a positive effect of capital openness in health and education expenditures. There are also those who find no conclusive evidence in favour of either hypothesis. Avelino et al. (2005) observe that financial openness puts no constraint on government spending.⁵ Dreher (2006), using an index of globalisation that includes economic, political and social integration over 30 OECD countries, finds that globalisation does not influence government spending and social expenditures.

Another factor that has been less analysed as a determinant of social expenditure is public sector income. Few empirical studies have examined the role of revenue constraints as a determinant of social spending (Garrett 1998; Kato 2003; Lindert 2004; Haggard and Kaufman 2004). They have argued that the fragile ability of fiscal institutions to collect taxes could be responsible for Latin America's low social expenditures during the 1980s and 1990s (Haggard and Kaufman 2004). This

⁴ In this regard, Wibbels (2006) indicates that the negative relationship between openness and social spending found in developing countries is caused by their dependent position in global markets. This is mainly due to prices of primary products, which tend to be more volatile, causing sharp changes in business cycles in developing countries. Volatility limits governments from obtaining funding from international markets during times of crisis and any ensuing production shocks, thereby reducing their spending capacity.

⁵ Moreover, several studies suggest that the compensation and the efficiency effects may differ depending on the type of social expenditure. Dion (2000, 2006) for developing countries and Kaufman and Segura-Ubiergo (2001) and Avelino et al. (2005) for Latin America, find that trade liberalisation has a positive impact on education and health expenditures, because it encourages governments to improve productivity and human capital, while they find negative correlations with social security.

fact is reinforced by the weak level of the fiscal burden in almost all countries of the region (Aldunate and Martner 2006). Governments with lower revenues and higher commitments to social services are more likely to face greater constraints on social spending, even under strong pressure from the beneficiaries (Haggard and Kaufman 2004). In addition, Gupta (1967) and Nomura (1991, 1995) have observed that the rise in revenue collection goes hand in hand with economic growth. Burgess and Stern (1993), Tanzi and Zee (2000), Fox and Gurley (2005) find a positive correlation between tax revenue and GDP per capita. This evidence ties in with Wagner's law of increasing state activity (Bird 1971), which states that government activities grow with the economic development of a country over time, through increasing public expenditure to satisfy social needs. Consequently, the fiscal burden and its connection with GDP per capita and its growth might also explain the dynamics of social spending.

Public indebtedness is another economic factor related to the fiscal burden that could influence social expenditures. Lora and Olivera (2007) and Lora (2009) find that excessive debt ratio and high interest payments on debt have a restrictive effect on social expenditure. This effect has been found to be greater in Latin American countries which constitutes a limitation not only for social security, but also for education and health spending (Hunter and Brown 2000; Dion 2006). Lora and Olivera (2007) observe that non-compliance with debt servicing can raise social spending in the short run, particularly in Latin America. However, Lora (2009) finds the opposite for the same region, except for highly indebted countries.

There are additional economic determinants of social expenditure highlighted in the literature. A rising unemployment rate is likely to increase social spending (Snyder and Yackovlev 2000; Kittel and Obinger 2003; Avelino et al. 2005). Avelino et al. (2005) argue that even if there are few unemployment programs in Latin America, there should be a positive relationship between unemployment and social spending, due to governments' efforts to counteract the negative effects of any crisis and to promote employment generation.

2.2 Demographic determinants of social spending

Social spending is also determined by the demographic structure of a country. For instance, growth in the ageing population increases social expenditure, mostly on health and retirement pensions, forcing many governments to restructure their social policy due to financial constraints. Lindert (1994, 1996) shows that an increase in the size of the population aged over 65 in OECD countries has a strong positive effect on social spending, especially on pensions, and negative effects on education. Gonzalez-Eiras et al. (2007: 24) apply an overlapping-generational model to disaggregated social spending in the United States. They observe that the demographic transition towards an older society in the United States led to a "reallocation of government spending from productive public education to unproductive intergenerational transfers". In contrast, the presence of a high percentage of young people (under 15) raises spending on education and health and lower social security spending. In this sense, Huber et al. (2008) find that health expenditure in Latin American and Caribbean countries increases with a large

young population, while in developed countries it rises with a large elderly population.

2.3 Political determinants of social spending

The third set of factors that influence spending on social programs is linked to political organisations and institutions. There is a vast body of literature that regards the political ideology of governments to have effects on social spending. Ruggie (1983), Diamant and Katzenstein (1986) and Rodrik (1997) emphasise that economic liberalism has been accompanied by an increase in social protection, not only in industrialised countries but also on a global scale, which rejects the efficiency hypothesis. According to Ross (1997, 2000) and Armingeon et al. (2001), right-wing parties are less likely to pursue policies that sustain the welfare state, due to their lower concern for workers' protection. Kitschelt and Herbert (2001) maintain that centre and right-wing parties are more reluctant to cut benefits or to impose fiscal austerity in times of economic recession.⁶ Roberts (2002) and Kitschelt et al. (2010) argue that left-wing parties do not have a significant influence on social policy, due to their low levels of institutionalization and the lack of substantive differences between left and right party labels, when compared to those in the developed countries (Niedzwiecki and Sara 2015). Hicks and Esping-Andersen (2003) present a comparative analysis of the role of left- and right-wing parties in the development of the welfare state. They observe that the correlations between social expenditure and the political orientation of the parties seem to be period-sensitive. In this regard, during the 1960s until the early 1980s, they find a positive effect of left-wing parties on social expenditure, but from that moment, the differences between parties of the left and right tend to disappear, due to retrenchments in the levels of social policies by left-wing governments since then.

Another related issue is whether authoritarian or democratic regimes have different levels of social spending. Some authors believe that democratic regimes have higher social costs due to high electoral risks. In this sense, Avelino et al. (2005) observe that countries in transition towards democracy may be able to increase social spending for the poor, because of the strength of this population sector's voting power. Regarding social spending categories, Kaufman and Segura-Ubiergo (2001) and Avelino et al. (2005) find a strong positive association between democracy and education spending in Latin America, as governments attempt to attract more voters through proper educational programs, or because there is a high percentage of young people in the population, which makes it more attractive for the government to spend on education. However, Avelino et al. (2005) do not find any significant correlation between democracy and spending on health and social security. Huber et al. (2008) indicate that, regardless of their ideological orientation, democratic regimes have a long-term positive impact on both social security spending and health/education spending. Conversely, highly repressive authoritarian governments have negative effects on health and education expenditures, but they

⁶ See Kittel and Obinger (2003) for an extensive review of partisan politics and political institutions as determinants of social expenditures in industrialised countries.

do not affect social security and welfare spending. This difference can be explained with the median voter theorem (Boix 1998; Dion 2006), which states that democratic regimes have higher social expenditures because they take into account the whole population in their welfare decisions and therefore the income of the median voter is lower than it would be in authoritarian regimes, where social spending would be targeted at the smaller group of supporters who benefit from the regime. On the other hand, authoritarian regimes may take more drastic decisions for or against social spending than in the case of democratic regimes, due to the absence of “veto points” characterised by Immergut (1990) or “veto players” postulated by Tsebelis (2002), provided by different political systems to interest groups by not allowing them to gain veto power to block political reforms.

In summary, we have described an extensive list of determinants highlighted in the literature, which may provide potential explanations about the different levels of social expenditure in Latin American countries and their growth. We are aware that this list is not exhaustive and that there are other variables that would be important to consider, depending on the objectives of the research topic. For the purposes of our study, we believe that we have covered a wide range of determinants of social expenditures that will help us to present differences among Latin American countries during the two periods under consideration.

The next section examines the economic, demographic and political determinants of social spending, listing the data sources. Subsequently, some methodological aspects are considered to properly evaluate their impact on social spending.

3 Data and variables

The measures of aggregate social expenditure as a percentage of GDP and its categories (health, education, social security and housing and other expenditures), both at current prices, are reported by the Economic Commission for Latin America and the Caribbean (ECLAC) Social Expenditure database. The economic variables included in the model are the logged real per capita (GDPpc), the sum of exports and imports as a percentage of GDP (trade), the stock of external debt to GNP (external debt) from CEPALSTAT.⁷ The inflow of foreign direct investment (FDI) (FDI inflows), the unemployment rate (unemployment) and the average interest paid on new external debt commitments (interest payments on debt) are derived from World Development Indicators (World Bank). Finally, the adjusted fiscal burden as a percentage of GDP (fiscal burden) is reported by the Latin America and the Caribbean Fiscal Burden Database, produced by the Inter-American Center of Tax Administrations (CIAT) and the Inter-American Development Bank (IDB). Regarding demographic factors, we considered the percentage of the population over age 65 reported by CEPALSTAT.

Under political determinants, we include several variables taken from Evelyne Huber and John D. Stephens, Latin America and the Caribbean Political Dataset,

⁷ See the technical note on http://interwp.cepal.org/sisgen/SisGen_MuestraFicha.asp?indicador=134&id_estudio=6.

1945–2012. The regime type (democracy), is a dichotomy coded as 0 for authoritarian regimes and semi-democracies, and as 1 for democracies. We also incorporated government political orientation, taking into account the sum of the proportion of seats in the lower house or constituent assembly held by right-wing parties (right). With this information, we created a dummy variable with value 1, if the right-wing parties held the majority of the seats and 0 otherwise. Finally, we added time dummies to explicitly capture the influence of aggregate time series trends. All variables will be calculated in levels and in differences (measured as year changes) to capture long-term and short-term effects.

In Table 4 for Appendix, we present a table for descriptive statistics. We also conducted a correlation analysis between explanatory variables using Spearman's rank correlation index.⁸ The highest correlation was observed between populations over 65 and GDPpc ($r = 0.71$), while the growth of the population over 65 had in general lower correlations with the rest of the variables. To discard multicollinearity among independent variables, we will calculate the variance inflation factor (VIF) after the OLS regression.

4 Methodology

There has been an intense debate about the appropriate models and estimation methods to analyse the determinants of social expenditure (Dion 2006). The literature has highlighted four main issues to take into account when estimating the impact of the determinants of social spending:

1. Modelling in levels or in differences.
2. Correcting for serial correlation in the error terms.
3. Obtaining more efficient estimators in the presence of contemporaneous correlated errors across units and heteroskedasticity in panel data models.
4. Controlling for heterogeneities across observations and/or common time shocks.

Regarding issue (1), there is a theoretical justification for using levels or differences depending on the expectations of how the independent variables influence social spending. Avelino et al. (2005), Dion (2006), Huber et al. (2008) and Lora (2009) estimate models in levels and put emphasis on long-term relationships; whereas Snyder and Yackovlev (2000), Kaufman and Segura-Ubiergo (2001) or Wibbels (2006) model in first differences, obtaining information about short-run effects. However, it is not only a theoretical choice since behind the selection of the model there are econometric considerations that should be taken into account. One of these is the existence of serial correlation in the error terms (issue 2), which typically causes an underestimation of the standard errors

⁸ The Pearson's correlation coefficient is sensitive to different data distributions, requiring normal distribution and linear relationships between variables. Instead, we present Spearman's rank correlation that assesses monotonic relationships, whether linear or not, not requiring normality. The correlation matrix is not included but it is available upon request from the author.

(Studenmund 2011). For this reason, social expenditure models have been frequently estimated using Prais–Winsten generalised linear regressions. An alternative method is modelling a first-order autoregressive panel data model, adding lagged values of the dependent variable as regressor (Kaufman and Segura-Ubiergo 2001; Avelino et al. 2005; Wibbels 2006; Dion 2006; Lora 2009). Beck and Katz (1995) conducted simulations with both methods, recommending the lag correction approach. However, it is still important to verify that the lagged dependent variable effectively removes the serial correlation through a Lagrange multiplier test (Kristensen and Wawro 2003).

An additional consideration is that models estimated in levels may show a spurious correlation, since most economic time series are non-stationary in the mean and show trend patterns (Granger and Newbold 1974). Cointegration techniques provide an excellent framework to test for the existence of a stable long-run equilibrium relationship between the non-stationary series (Engle and Granger 1987).⁹ This relationship can be described by an error-correction version (ECM) of an autoregressive distributed lag approach (ARDL). Kaufman and Segura-Ubiergo (2001) and Wibbels (2006) use an ARDL–ECM model to analyse the determinants of social expenditure growth in Latin American countries, regressing this variable against its own lag and other explanatory lagged variables in levels and differences to capture the short- and long-term. The estimated error-correction term measures the speed of short-run adjustment to long-run equilibrium after an exogenous shock. For this to happen, the coefficient needs to be statistically significant and negative, meaning that the error term is stationary, and therefore there is a cointegration relationship between social expenditure and its determinants, where any deviation from the equilibrium in the previous period will be adjusted at a rate given by this error term. We may also interpret this equation as a conditional beta convergence model, where the negative error-correction term is showing the presence of beta convergence and the control variables are giving information about different characteristics (levels and differences) that condition the convergence process to country-specific long-term upper-level equilibriums.

Issue (3) points out the need to deal with the contemporaneous correlation of errors across units—due to the common shocks in a given time period, and panel heteroskedasticity—caused by time-invariant individual characteristics of each unit, which cause ordinary least squares (OLS) estimators to be inefficient. To avoid both problems, and the first-order serial correlation, Beck and Katz (1995) using Monte Carlo methods propose an alternative estimator based on OLS with panel-corrected standard errors (PCSE), a method widely used in political science research. However, Kristensen and Wawro (2003) find that PCSE are robust only when individual effects are not taken into account in the model or not correlated with explanatory variables. Reed and Webb (2010: 11) find that the PCSE estimator does not perform as well when the explanatory variables are highly persistent, the error terms are serially correlated and the number of time periods is relatively short in comparison with the number of cross-section units. Under these circumstances, the

⁹ Therefore, it is necessary to check the integration properties of the series using panel unit root tests, before testing for cointegration.

PCSE estimator will tend to underestimate standard errors and over-reject hypotheses.

Issue (4) refers to the unobservable heterogeneity between units or individual effects, which may cause omitted variable bias. In dynamic panel data models, if the unit-specific effects are stochastic and they are correlated with the lagged dependent variable, then the OLS estimator is inconsistent due to its correlation with the error term (Bond 2002). Thus, before running the PCSE model, it is necessary to control for time and individual effects (Kaufman and Segura-Ubiergo 2001; Wibbels 2006).

There is an additional issue that must be taken into account: the potential endogeneity bias of some or all of the explanatory variables, causing the OLS estimator to be biased and inconsistent. This is not at least only the case of the lagged dependent variable in levels, but also those variables determined by others in the system due to bidirectional causality. In this regard, we expect the presence of causal dynamics between social expenditure and some of the explanatory variables. For instance, Lampman (1984) enumerates a list of benefits and costs of social expenditures to economic growth due to the positive effects on output of education, health, and the economic security of the labour force; macroeconomic stabilization; labour supply effects; productivity effects and resource reallocation effects. Görg et al. (2008) also find a positive impact of social welfare expenditure on FDI inflows, confirming the view that multinationals value the contribution of social expenditure on the increase of education and health standards, the development and maintenance of a social fabric and the reduction of political unrest. They also guarantee the cooperation of the unions and increase workers' and firms' incentives to invest in the industry. These relationships should be taken into account before carrying out any empirical analysis.

A common approach to control for endogeneity is through instrumental variables, where the generalised method-of-moments (GMM) developed by Hansen (1982) has been the most widely used procedure to obtain efficient estimators in the presence of heteroskedasticity (Baum et al. 2003). Lora and Olivera (2009) and Lora (2009) apply a first-difference GMM estimator to analyse the vulnerability of social expenditure to several fiscal variables, using as instruments the lagged levels of the explanatory variables. However, as Blundell and Bond (2000) point out, when the lagged values of the series used as instruments are weakly correlated with the first differences of the endogenous variables, then the first-differenced GMM estimator results are expected to be downward biased in the direction within the groups. This problem is even more severe when series are highly persistent and the time period is small (Yasar et al. 2006). For this reason, Arellano and Bover (1995) and Blundell and Bond (1998, 2000) recommend the use of the system GMM estimator, which combines the moment conditions defined for the first-differenced equation with the moment conditions defined for the level equation. It uses the lagged levels of the series as instruments for the first-difference equation and the lagged first-differences of the series as instruments for the level equation. Blundell and Bond (1998) showed that the system GMM estimator results in consistent and efficient parameter estimates and has better asymptotic and finite sample properties (Yasar et al. 2006).

5 Empirical strategy and evidence

Following the methodological issues discussed above, we need to first verify that the panel model represents a structural long-run equilibrium relationship and not a spurious regression. Estimates from non-stationary series can reveal this problem, unless they are cointegrated. The non-stationarity of the variables will be tested by panel unit root tests, since univariate unit root tests such as Dickey–Fuller or augmented Dickey–Fuller can suffer from poor power properties in small samples (Pierce and Shell 1995). We specifically use Im et al. (2003) and Fisher-type (Choi 2001) panel unit root tests. All tests were conducted including constant and linear time trend, except for unemployment and political variables that do not show a time trend. These results are reported in Table 1.

Both tests support the hypothesis of a unit root for most of the level variables demonstrating that the series are not stationary except for democracy, which is stationary or integrated of order zero, $I(0)$. The variables in first differences are all stationary, indicating that they are integrated of order one or $I(1)$.

Next, we examine the long-run relationship between social expenditure and its determinants estimating a panel error-correction model (ECM) to find cointegration relationships between the $I(1)$ and $I(0)$ variables of the model.

We start with an autoregressive distributed lag model ARDL (1,1) transformed into an error-correction model (ECM) presented by Beck and Kats (1996: 11).

$$\Delta y_{it} = \alpha_0 + \Delta x_{it} \beta_{1k} + \theta(y_{it-1} - x_{it-1} \gamma_k) + v_{it}, \quad (1)$$

We can rewrite this model in a more intuitive way following Zivot (1994) and Kaufman and Segura-Ubiergo (2001):

$$\Delta y_{it} = \alpha_0 + \theta y_{it-1} + \Delta x_{it} \beta_{1k} + x_{it-1} \beta_{2k} + v_{it}, \quad (2)$$

with $\beta_{2k} = -(\theta \gamma_k)$ and $v_{it} = \eta_i + u_{it}$ where y_{it} is social expenditure as a share of GDP of country i in period t . Δy_{it} is its growth. y_{it-1} is the lagged dependent variable that corrects for autocorrelation in the error terms. Δx_{it} is the growth of economic and political variables. x_{it-1} is a vector of lagged economic and political variables. v_{it} is the composite error term that includes η_i , the unobservable time-invariant individual effects, correlated with the explanatory variables, but not with their differences, and u_{it} is the error term assumed to be i.i.d. $(0, \sigma_u^2)$. β_{1k} represents the short-term impact of x_{it} on y_{it} , while θ represents the long-term impact between both variables, showing the rate at which x_{it} and y_{it} return to their long-term equilibrium relationship (Beck and Katz 1996: 11). This coefficient is precisely the error-correction term that measures the speed of short-run adjustment to long-run equilibrium after an exogenous shock. If θ is significant and negative and the disturbance is stationary, there is a long-term or cointegration relationship between social expenditure and its regressors, where any deviation from the equilibrium in the previous period will be adjusted at rate θ^{10} . This result may also be interpreted as evidence of beta convergence.

Table 1 Panel unit root tests

Variable	Panel unit test, constant and linear time trend, Ho, pp, unit root, differences (growths)		Panel unit test, constant and linear time trend, Ho, pp, unit root, levels	
	Im et al. (2003)	Fisher z (Choi 2001)	Im et al. (2003)	Fisher z (Choi 2001)
CD test				
Total social expenditure	30.59 (0.000)	1.987 (0.976)	1.696 (0.955)	1.987 (0.976)
Education expenditure	27.58 (0.000)	2.253 (0.987)	1.768 (0.961)	2.253 (0.987)
Health expenditure	22.42 (0.000)	1.404 (0.919)	0.951 (0.823)	1.404 (0.919)
Social security expenditure	16.96 (0.000)	0.842 (0.800)	0.264 (0.604)	0.842 (0.800)
Per capita income (logged)	46.40 (0.000)	2.561 (0.995)	1.662 (0.952)	2.561 (0.995)
Tax burden	28.73 (0.000)	- 0.339 (0.367)	- 0.748 (0.227)	- 0.339 (0.367)
Trade (% of GDP)	22.57 (0.000)	1.469 (0.929)	0.766 (0.778)	1.469 (0.929)
Foreign direct investment inflows (% GNI)	14.00 (0.000)	- 0.078 (0.469)	- 0.447 (0.327)	- 0.078 (0.469)
External debt (% GNI)	16.45 (0.000)	0.265 (0.605)	0.166 (0.566)	0.265 (0.605)
Interest payments on debt	20.42 (0.000)	- 0.571 (0.284)	- 1.092 (0.137)	- 0.571 (0.284)
Unemployment	8.24 (0.000)	0.458 (0.676)	0.430 (0.666)	0.458 (0.676)
Population over 65/total	55.13 (0.000)	1.429 (0.923)	2.839 (0.997)	1.429 (0.923)
Democracy		- 4.667*** (0.000)	- 5.129*** (0.000)	- 4.667*** (0.000)
		(0.998)	(0.994)	(0.998)
Right-wing party dummy		2.460 (0.993)	2.042 (0.979)	2.460 (0.993)

pp, CD Test, pp, Pesaran's (2004) cross-sectional dependence (CD) test, has a null hypothesis cross-section independence. In all cases, the null hypothesis is rejected for all variables. Then we use second generation panel data unit root tests, which allow cross-sectional dependence. Im et al. (2003) and Fisher-type (Choi 2001) tests have as the null hypothesis with all the panels that contain a unit root. Panel unit root test is performed using the Stata "xtunitroot". Number of lags was selected using the AIC criterion

p values in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively for stationary variables. Democracy variable is stable in time, so it is already *I*(0), which means that the variable was generated by a stationary process

Below we present different estimators of Eq. (2) to check the validity of the results (see Table 2).¹⁰ Columns 1 and 2 show OLS and fixed effect coefficients. We know that the OLS estimates are biased upwards, because the lagged dependent variable is positively correlated with the fixed component of the error term (η_i). Conversely, the fixed effect coefficients are biased downwards due to the negative sign on u_{t-1} in the transformed error term. Given the opposite directions of bias in both estimates, any consistent estimate should lie between these values (Yasar et al. 2006). The PCSE estimator controls for the heteroskedastic and contemporaneous correlation in the error term across units. However, it may not perform as well in the presence of persistent explanatory variables, serially correlated errors, and relatively short time periods in comparison with the number of cross-section units (Reed and Webb 2010). We finally present the first difference generalised method-of-moments estimator (GMMdif) and the system GMM estimator (GMMsys), setting out the endogenous variables with their lagged levels in the first case and the lagged levels and differences in the second. With respect to endogeneity, the lagged dependent variable (y_{it-1}) is clearly endogenous (remember that $\Delta y_{it} = y_{it} - y_{it-1}$). We will also assume that GDPpc, FDI inflows and fiscal variables are endogenous due to reverse causality.¹¹

Table 2 shows the relationship between social expenditure growth and its determinants using different estimation procedures. In all cases, the coefficients of the lagged levels of social spending are significant and negative. This indicates a statistically significant cointegrating relationship between social expenditures and its determinants, showing a long-run equilibrium relationship between them. Any unanticipated shock that changes the equilibrium path would be restored in the future periods at speeds that range between 3.3% per year for the OLS regression and 27% per year in the fixed effect (FE) regression. But as we have already mentioned, the OLS estimates are upward biased, while FE regression is downward biased. The third column presents the PCSE regression¹² which shows estimates very close to those of OLS, presenting the same direction of bias (Chen et al. 2005). Then we take into account the endogeneity of the lagged dependent variables among the regressors together with some economic and fiscal variables (GDPpc, fiscal burden, external debt and FDI inflow), using the first-differenced GMM and the system GMM estimators. The Arellano and Bond (1991) test for autocorrelation confirms that both GMM estimators are consistent, finding first-order serial correlation in the error term of the first differences equation, but not second-order serial correlation. The validity of the set of instruments consisting of the lagged levels of the endogenous variables in $t - 2$ and earlier periods is tested by the Sargan test of overidentifying restrictions.¹³ The first-differenced GMM instruments

¹⁰ We estimated different System GMM regression in order to check the robustness of the independent variables. Results were consistent with the estimates presented in Table 2. The results are available on request.

¹¹ We assume that social expenditures may affect and be affected by GDPpc, FDI inflows, fiscal burden and external debt.

¹² We used the same specification for the PCSE model as Kaufman and Segura-Ubiergo (2001).

¹³ This test is analogous to a Lagrange multiplier (LM) test and verifies whether the lagged dependent variable eliminates serial correlation of the error terms (Baum et al. 2003).

Table 2 Estimated error-correction model: long-run and short-run dynamics of social expenditure and its determinants

Explanatory variables	1990–2012			1990–2000			2000–2012		
	(1) OLS	(2) FE	(3) PCSE	(4) Differenced GMM	(5) System GMM	(6) System GMM	(7) System GMM		
Social expenditure ($t - 1$)	-0.0338** (0.0133)	-0.269*** (0.0616)	-0.0394*** (0.0110)	-0.299*** (0.0378)	-0.0989*** (0.0204)	-0.190*** (0.0433)	-0.104*** (0.0186)		
Fiscal burden ($t - 1$)	0.0340* (0.0185)	0.103 (0.0704)	0.0388 (0.0299)	0.107* (0.0587)	0.0363 (0.0293)	0.120** (0.0572)	0.0403 (0.0307)		
Fiscal burden growth	0.0927 (0.0770)	0.0941 (0.0644)	0.100 (0.0755)	0.0906 (0.0661)	0.0871* (0.0510)	0.0541 (0.0722)	0.135** (0.0598)		
Per capita income (GDPpc) (logged) ($t - 1$)	-0.0105 (0.0109)	-0.238* (0.117)	-0.00928 (0.0184)	-0.169** (0.0846)	-0.00159 (0.0168)	0.0294 (0.0322)	0.0191 (0.0228)		
Per capita income growth	0.0990 (0.222)	-0.0245 (0.272)	0.0955 (0.195)	-0.0170 (0.177)	0.0625 (0.142)	0.449* (0.250)	-0.402*** (0.143)		
Trade (% GDP) ($t - 1$)	0.00187 (0.0130)	-0.0334 (0.0473)	0.00294 (0.0110)	-0.0354 (0.0365)	-0.00278 (0.0115)	0.00932 (0.0166)	-0.00247 (0.0164)		
Trade growth	-0.0999* (0.0495)	-0.123*** (0.0408)	-0.102 (0.0776)	-0.115** (0.0573)	-0.112** (0.0454)	-0.0610 (0.0633)	-0.163*** (0.0592)		
Foreign direct investment flows (%GNI) ($t - 1$)	0.00452 (0.00403)	0.00780** (0.00362)	0.00506 (0.00726)	0.000822 (0.00864)	0.00857 (0.00734)	0.0216 (0.0154)	0.0120 (0.00758)		
Foreign direct investment growth	0.0203** (0.00934)	0.0159* (0.00875)	0.0202** (0.00939)	0.0121 (0.00780)	0.0200*** (0.00661)	0.0325*** (0.0112)	0.0155** (0.00728)		
External debt (%GNI) ($t - 1$)	-0.0239** (0.00996)	-0.0353* (0.0190)	-0.0253 (0.0185)	-0.0567*** (0.0189)	-0.0328** (0.0141)	-0.0841** (0.0346)	-0.0104 (0.0184)		
External debt growth	-0.0138 (0.0253)	0.0138 (0.0324)	-0.0107 (0.0471)	-0.00987 (0.0372)	-0.0103 (0.0303)	-0.0879* (0.0496)	0.0375 (0.0358)		
Interest payments on debt ($t - 1$)	0.0154 (0.0134)	-0.0165 (0.0180)	0.0148 (0.0130)	-0.0204 (0.0155)	0.00860 (0.00999)	-0.0169 (0.0219)	0.00616 (0.0114)		

Table 2 continued

Explanatory variables	1990–2012			1990–2000			2000–2012		
	(1) OLS	(2) FE	(3) PCSE	(4) Differenced GMM	(5) System GMM	(6) System GMM	(7) System GMM	(8) System GMM	(9) System GMM
Interest payments on debt growth	-0.0351 (0.0202)	-0.0391 (0.0231)	-0.0328 (0.0239)	-0.0380** (0.0156)	-0.0270** (0.0127)	-0.0308 (0.0211)	-0.0122 (0.0140)		
Unemployment ($t-1$)	-0.0291** (0.0114)	-0.0552** (0.0224)	-0.0285 (0.0222)	-0.0346 (0.0261)	-0.0247* (0.0130)	0.00379 (0.0235)	-0.0390** (0.0176)		
Unemployment growth	-0.0126 (0.0548)	-0.00875 (0.0486)	-0.00943 (0.0392)	0.00749 (0.0312)	0.00531 (0.0248)	0.0263 (0.0340)	0.0106 (0.0314)		
Population over 65 ($t-1$)	0.0109 (0.0300)	0.394** (0.176)	0.0118 (0.0197)	0.233 (0.194)	0.0375 (0.0300)	-0.0147 (0.0502)	0.0150 (0.0410)		
Population over 65 growth	-0.671 (0.804)	-0.953 (0.710)	-0.718 (0.739)	-0.744 (0.972)	-0.538 (0.711)	-2.793 (2.118)	-0.329 (0.644)		
Democracy ($t-1$)	-0.0306** (0.0119)	-0.0400* (0.0194)	-0.0304** (0.0133)	-0.0531*** (0.0196)	-0.0265** (0.0114)	0.0337* (0.0202)	-0.0558*** (0.0158)		
Democracy growth	-0.0534* (0.0301)	-0.0408 (0.0277)	-0.0508* (0.0303)	-0.0438* (0.0256)	-0.0351* (0.0208)	-0.0440 (0.0271)	0.00137 (0.0259)		
Right-wing party ($t-1$)	0.00689 (0.0100)	0.0312 (0.0274)	0.00644 (0.0108)	0.0222 (0.0208)	0.00383 (0.00978)	-0.0359* (0.0185)	0.00852 (0.0109)		
Right-wing party growth	-0.00516 (0.0269)	0.0222 (0.0201)	-0.00503 (0.0362)	0.0164 (0.0269)	0.00525 (0.0209)	-0.0441 (0.0318)	0.0138 (0.0252)		
Constant	0.327** (0.137)	2.219** (1.036)			0.272* (0.162)	0.248 (0.283)	0.152 (0.245)		
Observations	349	349	349	325	349	163	186		
R2	0.210	0.333	0.204						

Table 2 continued

Explanatory variables	1990–2012		1990–2000		2000–2012		
	(1) OLS	(2) FE	(3) PCSE	(4) Differenced GMM	(5) System GMM	(6) System GMM	(7) System GMM
R2 adjusted	0.108	0.246					
Variance inflation factor (VIF) (mean)	2.61						
ar1p				0	0	0	0
ar2p				0.824	0.844	0.442	0.271
Sarganp				0.00451	0.334	0.133	0.153
Difference in Sargan					0.612	0.490	0.238

Periods 1990–2012, sub-periods 1990–2000 and 2001–2012. GMM system estimates

We use as instruments the lagged levels of social expenditures, GDPpc, unemployment fiscal burden and external debt (dated $t - 2$ and earlier) in the first-differenced equations for the first differenced GMM estimator. For the system GMM estimator, lagged first differences of the endogenous variables (dated $t - 2$ and earlier) are used as additional instruments in the level equations. Year dummies are included in each model (not shown). Asymptotically robust standard errors are reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

are rejected by the Sargan test,¹⁴ showing that the lagged levels of the endogenous variables are not independent from the error term. In addition, the GMM in first differences error-correction coefficient lies outside the confidence interval given by OLS and FE estimates, confirming that it suffers from large finite sample bias caused by weak instruments. The fifth column presents the system GMM estimates. The validity of both sets of instruments, lagged levels dated $t - 2$ and earlier in the first-differenced equations and lagged first differences dated $t - 2$ and earlier in the levels equations, is not rejected by the Sargan test of overidentifying restrictions and the differenced Sargan test, respectively. In addition, the error-correction coefficient lies in between the OLS and FE estimates, which means that these coefficients are more efficient and unbiased than the former specifications.

Focussing on the system GMM estimator, the error-correction term is -0.098 meaning that the system adjusts towards long-run or steady state equilibrium at almost 10% annually. Aggregate social expenditure will adjust to any discrepancy between social expenditure and its determinants in previous periods at this speed. This coefficient also shows the presence of diminishing marginal returns in social expenditures, which means that countries with a higher level of social spending tend to have lower growth rates in this variable. These results support the existence of beta convergence across Latin American countries. The next two columns report estimates for the Washington Consensus period (1990–2000) and the post-Washington Consensus period (2000–2012). We observe that the convergence speed to steady state was higher in the first period.¹⁵

To determine whether we are in the presence of absolute beta convergence towards a common steady state or conditional beta convergence towards country-specific steady states, we need to test for the presence of sigma convergence, calculated as the coefficient of variation of social expenditure growth. There would be absolute beta convergence, if economies have diminishing returns in the expansion of social expenditure and, therefore, a downward trend in the coefficient of variation. On the other hand, if we find stationarity in the series with coefficient of variation far different from zero, we could conclude that there is conditional beta convergence of each country towards its own steady state. Therefore, we look upon convergence as a stochastic process (Bernard and Durlauf 1996) and test the stationarity of the series by conducting an augmented Dickey–Fuller unit root test and a Phillips–Perron test (Table 3).

As we can observe in Table 3, in all cases, we reject the null hypothesis of a unit root, confirming that the series are stationary with mean different from zero, demonstrating that differences in countries' growth rates are steady. This means that each country has converged to its own steady state conditioned by structural

¹⁴ The null hypothesis of the Sargan test is that there is independence between the set of instruments and the error terms. Thus, for instruments to be valid, failure to reject the null hypothesis is needed.

¹⁵ In Appendix 3 we include a table with the GMM system estimates of the economic, demographic and political determinants for the main categories of social expenditure (education, health, social security and housing and other expenditures). The coefficients of the lagged levels of all social expenditure categories were significant and negative. For all categories except for housing and other expenditures, the speed of convergence to long-term equilibrium was higher in the period 1990–2000.

Table 3 Coefficient of variation of social expenditure growth

Tests	Total social expenditure	Education expenditure	Health expenditure	Social security expenditure	Housing and other expenditure
Coefficient of variation 1991–2012 (average)	1.496	1.341	1.067	1.677	0.524
Augmented Dickey–Fuller, $z(t)$	– 3.230** (0.018)	– 3.771*** (0.003)	– 3.586*** (0.006)	– 3.114** (0.025)	– 3.792*** (0.003)
Phillips–Perron, $z(t)$	– 3.780*** (0.003)	– 5.452*** (0.000)	– 4.574*** (0.000)	– 4.553*** (0.000)	– 3.907*** (0.002)

pp. Number of lags was selected using the AIC criterion. *p* values in parenthesis. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively for stationary variables

differences, given by the statistically significant determinants of social spending that are analysed below.

Looking at the period as a whole (1990–2012), the factors that explained the differences in social expenditure efforts between Latin American countries were: fiscal burden and FDI growth both with a positive effect, while trade growth, the level of external debt, the increase of interest payments on debt, the level of democracy and its growth had a negative effect. However, when we distinguish between the two sub-periods, we find interesting contrasts. During the Washington Consensus period (1990–2000), differences in social spending across Latin American countries were mainly related to structural fiscal factors. As column 8 from Table 2 shows, those countries with a higher fiscal burden and lower external debt experienced higher social expenditure growth, mainly in health programs in the first case and education spending in the second (see Table 6 in Appendix). Interest payments on external debt had a negative effect on social expenditure, although its level of significance is below 10% (*p* value = 0.199). If we take this as valid, it means that they may have caused a reduction social expenditure as highlighted by Hunter and Brown (2000), Dion (2006) and Lora (2009). In Table 6 in Appendix, we see that they impacted negatively on health expenditure during the first period 1990–2000. This reflects the fact that during these years, Latin American governments’ social spending decisions were clearly influenced by the fiscal discipline imposed by the Washington Consensus and that the countries that could increase their social expenditures more were those with a greater fiscal burden and lower external debt. Other variables that affected social expenditure during this period were economic growth, finding evidence for pro-cyclical effects and validating the Wagner’s law of increasing state activity accompanying economic growth. Those countries that increased their foreign direct investment inflows tended to boost their social effort which gives support to the compensation hypothesis, where higher international competition could have encouraged governments to increase social spending to boost workers’ productivity through greater investment mainly in education, with a view to enhancing labour productivity. This is not surprising as during this period, there was a move towards greater investment in key development issues such as primary education, primary health care and

infrastructure (Williamson 1990).¹⁶ During this period, we also find that the more democratic governments in Latin America have tended to spend more on education programs, and right-wing governments spent less than centre and left-wing governments, indicating that they were more committed to the prescriptions of the Washington Consensus with respect to fiscal austerity.

As we have indicated, from 2000 Latin American countries were progressively moving away from the guidelines of the Washington Consensus and, as our results suggests, this altered Latin American governments' social spending decisions, which changed the factors that explained the differences in social spending growth between Latin American countries. Results from column 7 clearly reflects a change in social spending determinants between the two periods, showing that during the post-Washington Consensus period, the evolution of social spending was mainly determined by short-term or conjunctural variables rather than by countries' fiscal discipline. The growth of GDP per capita, fiscal burden, trade and FDI inflow were the variables that explained the differences in the evolution of social spending. Countries with a higher fiscal burden growth tended to spend more on social programs, mainly through social security investments (see Table 6 in Appendix). Countries also applied counter-cyclical measures to stabilize their social expenditures, as we found a negative and significant effect between GDP per capita growth and social spending¹⁷ (mainly in health expenditure). The 2008 international financial crisis contributed to the intensification of this process. Additionally, the increase in trade openness had a significant negative impact on social expenditure growth, negatively affecting education investments. This gives support to the efficiency hypothesis during the post-Washington Consensus period, probably due to claims of exporters exposed to increases in international competition as evidenced by Kaufman and Segura-Ubiergo (2001) and Wibbels (2006). Finally, governments facing higher FDI inflows tended to increase their social expenditures. Other factors that affected social policy during these years were unemployment and democracy, both with a negative impact on social expenditure growth. In the first case, higher unemployment is associated with lower tax income affecting negatively the resources for social policies. This may have led to cuts in education spending to offset the reduction in fiscal income. In the second case, the negative coefficient on democracy means that more authoritarian governments in Latin America have tended to spend more on social policies, affecting mainly social security investments (see Table 6 in Appendix). Avelino et al. (2005) observe that countries in transition towards democracy may be able to increase social spending for the poor, because of the strength of the voting power of this population sector. Authoritarian regimes may take more drastic decisions for or against social spending than democratic regimes, due to the absence of "veto points" characterised by Immergut (1990) or "veto players" postulated by Tsebelis (2002), provided by different political systems to interest groups, not allowing them

¹⁶ In Appendix 3 we observe that FDI inflows positively affected education expenditures both in the short term and long-term.

¹⁷ The effects of GDP per capita in both periods have a similar value but opposite signs, explaining why the estimate for the whole period is close to zero.

to gain veto power to block political reforms. Left-wing governments also paid more attention to social policies, promoting health expenditures (see Table 6 in Appendix). This confirms the results of Ruggie (1983), Diamant and Katzenstein (1986) and Rodrik (1997) but goes against those of Ross (1997, 2000) and Armingeon et al. (2001), for whom left-wing parties have a greater preoccupation with the protection of workers through social security expenditure.

6 Conclusions

In this paper, we have examined economic, demographic and political determinants of social spending in Latin America during the period 1990–2012 in 17 Latin American countries. Special attention was paid to the evaluation of convergence towards a common upper-bounded steady state (absolute beta convergence) or to specific steady states conditioned by their country-specific determinants (conditional beta convergence). We also considered two sub-periods, the Washington Consensus period (1990–2000) and the post-Washington Consensus period (2001–2012), showing that those determinants may have affected the long-term equilibrium of social expenditures in different ways.

For this purpose, we analysed an extensive list of determinants highlighted in the literature, which may provide potential explanations about the different levels of social expenditure in Latin American countries. We are aware that this list is not exhaustive and that it would be important to consider other variables in future research depending on the topic analysed.

In this context, we applied a dynamic panel data error-correction model to capture short- and long-term relationships between social expenditure and the set of economic, demographic and political variables. To control for the endogeneity bias caused by bidirectional causality between social expenditure growth and some of its determinants, we used GMM estimators. We treated as endogenous the lagged level of social expenditures. We also assumed that GDP per capita, fiscal burden, external debt and FDI inflow may have a reverse causality with social expenditures, i.e. that those variables may affect and be affected by social expenditures. Before running all the regressions, it was necessary to check for the order of integration of the series, to discard the possibility of spurious results due to common trends between the dependent and the independent variables. We found that all variables were integrated of order 1, except for democracy that was already stationary in levels or integrated of order 0. Concerning the regression procedure, we demonstrated that GMM system estimators were more efficient and unbiased than other estimators proposed in the literature (OLS, fixed effects, panel correction standard errors and first-differenced GMM). The system GMM regression found strong evidence of cointegration between social spending and its determinants, which suggests that there is a long-term relationship between those $I(1)$ variables during the whole period analysed. This analysis also shows diminishing returns in social expenditures, confirming the hypothesis of conditional convergence toward country-specific equilibria, as disparities across countries did not disappear in the long run. That means that the different economic, demographic and political characteristics of each

country have an equilibrium relationship with their social expenditures, leading them to a long-term equilibrium which is different for each country. It also means that any unanticipated shock that changes the equilibrium path will be restored in future periods at the speed given by the error-correction term.

Several variables are responsible for the differences in social security equilibriums across Latin American countries. During the Washington Consensus period (1990–2000), countries appear to have reacted more evenly in their social expenditure policies, relating their investment decisions to fiscal structural factors. As a consequence, differences across Latin American countries reduced rapidly, thereby possibly resulting in an absolute beta convergence toward a common social expenditure steady state. However, the poor outcomes of the Consensus recipe in terms of economic growth and inequality reduction drove Latin American governments to progressively abandon this fiscal orthodoxy. After 2000, each country tended to adapt its policies into a strategy of self-discovery, exploiting their own economic and political characteristics and constraints (Rodrik 2005). During the post-Washington Consensus period (2000–2012), countries reacted proactively to promote an endogenous growth through short-term measures. In this respect, we found that the pace of convergence to a long-term equilibrium reduced significantly with respect to the first period. Also the determinants of social expenditure policy changed and were now more related to short-term or conjunctural factors like fiscal burden growth, GDP per capita growth, FDI inflow growth and international trade growth.

Other determinants were stable during the whole period (1990–2012). Countries seem to have applied a compensation hypothesis related to FDI inflows, incrementing their social expenditures to boost workers' productivity to overcome greater volatility and risk as evidenced by Kaufman and Segura-Ubiergo (2001). However, trade openness has negatively affected social expenditures in the second period, mainly in education investment. With respect to GDP per capita growth, it was an important short-term determinant of social expenditure, having a similar impact in both periods but with opposite signs. During the first period, countries reacted positively to economic growth showing that social policy was pro-cyclical, while in the second period it seems to be counter-cyclical. The economic downturn after the 2008 international financial crisis deepened this change, driving governments to apply discretionary stabilization policies to counteract the negative impact on employment, economic activity and social vulnerability.

The political variables show that during the first period, democratic left-wing governments tended to have a long-term positive impact on social expenditure, specifically on education and health. By contrast, during the second period authoritarian regimes, regardless of their ideological orientation, they may have taken more drastic decisions in favour of social spending than in the case of democratic regimes.

In conclusion, we have observed that structural and conjunctural differences between Latin American countries explain the differences in the evolution of social expenditure in the region. We do not find a natural process of saturation and convergence to a common upper-limit welfare state long-term equilibrium as stated by Flora (1986) and Kitter and Obinger (2003), the catch-up hypothesis. We agree

with Lora (2009) that social expenditure has a certain inertia, however, the discrete reduction in dispersion across countries indicates that Latin American countries are not converging towards a common upper-bounded steady state on social effort. Instead, these results must be interpreted as evidence of conditional beta convergence, where each country is moving towards its own steady state in social effort, which is consistent with the persistence of disparities across countries. The disparities across countries in social expenditure growth are determined by economic, demographic and political differences across Latin American countries.

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Appendix

See Tables 4, 5 and 6.

Table 4 Sources of variables and summary statistics

Variable	Source	Obs.	Mean	Standard deviation	Min.	Max.
Total social expenditure (%GDP) ^a	CEPALSTAT	391	11.24	5.27	2.51	25.55
Education expenditure (%GDP)	CEPALSTAT	391	3.60	1.43	0.70	7.79
Health expenditure (%GDP)	CEPALSTAT	391	2.48	1.27	0.44	6.75
Social security expenditure (%GDP)	CEPALSTAT	391	4.38	3.55	0.05	15.32
Housing and other expenditures (%GDP)	CEPALSTAT	391	0.99	1.31	0.00	9.16
Fiscal burden	BID-CIAT 2012	391	19.93	6.08	7.84	40.80
Fiscal burden growth	BID-CIAT 2012	374	0.02	0.08	-0.45	0.32
Per capita income (logged USD)	World Development Indicators (World Bank)	391	8.39	0.66	6.97	9.50
Per capita income growth ^b	World Development Indicators (World Bank)	374	0.02	0.03	-0.12	0.15
Trade (export + import) (%GDP)	World Development Indicators (World Bank)	391	63.36	33.56	13.00	167.83
Trade growth	World Development Indicators (World Bank)	374	0.88	6.14	-38.84	28.38
Foreign direct investment inflows (%GDP)	World Development Indicators (World Bank)	391	3.09	2.61	-2.50	17.13
Foreign direct investment inflows growth	World Development Indicators (World Bank)	374	0.15	1.92	-7.55	9.99
External debt (% GDP)	CEPALSTAT	391	47.01	38.11	11.41	302.86
External debt growth	CEPALSTAT	374	-1.78	10.36	-106.57	76.66
Average interest on new external debt commitments (%)	World Development Indicators (World Bank)	391	2.92	2.10	0.38	17.69
Interest payments of debt growth	World Development Indicators (World Bank)	374	-0.08	1.35	-12.58	16.34
Unemployment rate (% working population)	World Development Indicators (World Bank)	391	8.52	3.84	1.30	20.00
Unemployment growth	World Development Indicators (World Bank)	374	-0.06	1.45	-5.42	6.00
Democracy dichotomy "0" is authoritarian and semi-democracy; "1" is democracy	Latin America and Caribbean Political Dataset, 1945-2012	391	0.70	0.46	0.00	1.00
Right-wing party dummy "1" if the seat share is a majority, "0" otherwise.	Evelyn Huber and John D. Stephens Latin America and Caribbean Political Dataset, 1945-2012	391	0.36	0.48	0.00	1
Right-wing party (growth)	Evelyn Huber and John D. Stephens Latin America and Caribbean Political Dataset, 1945-2012	374	0.00	0.16	-1	1

Table 5 Latin American social expenditures as GDP percentage, 1990, 2000, 2012

	1990						2000						2012					
	TSE	EDE	HE	SSE	OE		TSE	EDE	HE	SSE	OE		TSE	EDE	HE	SSE	OE	
Argentina	9.53	1.12	2.20	6.15	0.05		9.13	0.83	2.07	6.23	0.01		11.95	1.72	0.71	9.06	0.46	
Bolivia	5.17	3.12	0.49	1.50	0.06		11.51	5.20	1.28	4.78	0.26		11.45	5.23	1.34	4.63	0.26	
Brasil	22.78	5.14	4.64	11.63	1.36		20.62	4.80	3.84	10.91	1.08		25.06	5.48	5.01	13.14	1.43	
Chile	11.30	2.15	1.67	7.23	0.24		14.22	3.67	2.69	7.51	0.35		14.72	4.27	3.70	6.33	0.43	
Colombia	5.69	2.23	0.87	2.16	0.43		10.15	3.25	1.91	4.03	0.96		13.10	3.03	1.95	7.42	0.70	
Costa Rica	16.13	4.07	4.96	5.15	1.95		17.32	4.85	5.02	5.96	1.49		22.98	7.38	6.75	6.65	2.20	
Ecuador	3.90	2.53	1.11	0.26	0.00		2.51	1.53	0.56	0.31	0.11		8.00	4.56	1.78	1.38	0.28	
El Salvador	6.36	1.82	2.19	1.99	0.75		10.03	3.14	3.94	3.17	1.19		14.81	3.92	4.04	4.83	2.03	
Guatemala	3.87	1.85	1.04	0.85	0.14		6.85	2.72	1.17	1.14	1.52		7.56	3.20	1.06	1.48	1.82	
Honduras	6.44	3.56	2.57	0.31	0.00		7.82	4.77	2.76	0.29	0.20		10.30	6.51	3.87	0.51	0.20	
Mexico	5.43	2.21	2.47	0.11	0.64		8.47	3.38	1.99	2.23	0.87		10.65	3.47	2.69	3.09	1.41	
Nicaragua	5.53	3.13	3.07	2.00	1.20		6.63	2.96	2.37	1.50	1.30		9.52	4.00	3.00	1.87	2.53	
Panama	6.33	3.57	1.44	1.06	0.26		9.06	4.02	2.04	1.75	1.25		9.57	3.58	1.69	1.31	2.99	
Paraguay	7.29	0.81	1.50	2.99	0.08		8.51	3.75	2.12	3.49	0.02		17.85	5.83	4.24	7.26	0.52	
Peru	5.83	1.87	1.08	2.33	0.59		8.88	3.00	1.52	3.72	0.65		9.78	2.96	2.50	3.03	1.29	
Uruguay	15.65	2.40	2.71	10.23	0.31		22.50	2.85	3.65	14.40	1.60		24.12	3.67	5.96	10.66	1.59	
Venezuela	11.19	4.08	1.97	2.46	2.63		14.94	5.92	2.63	3.75	2.64		21.16	5.97	4.50	9.16	1.53	
Average	8.73	2.68	2.12	3.44	0.63		11.13	3.57	2.44	4.42	0.91		14.27	4.40	3.22	5.40	1.27	
Coefficient of Variation	0.59	0.42	0.59	1.01	1.19		0.47	0.36	0.47	0.85	0.78		0.41	0.34	0.54	0.69	0.68	
Range (max-min)	18.90	4.33	4.47	11.52	2.63		19.99	5.09	4.46	14.10	2.62		17.50	5.66	6.04	12.63	2.79	
Variation 1990-2000	27.5%	33.2%	15.1%	28.5%	44.4%													
Variation 2000-2012	28.2%	23.2%	32.0%	22.2%	39.6%													

TSE total social expenditure, EDE education expenditure, HE health expenditure, SSE social security expenditure, OE other expenditure

Table 6 Determinants of social spending (%GDP) in 17 Latin American countries. Period 1990–2000 and 2001–2012. GMM Estimates

Variables	2001–2012							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Education	Health	Social Security	Housing and Other	Education	Health	Social Security	Housing and Other
Education ($t - 1$)	- 0.265*** (0.0439)				- 0.0965** (0.0484)			
Health ($t - 1$)		- 0.244*** (0.0414)				- 0.0957*** (0.0308)		
Social security ($t - 1$)			- 0.340*** (0.0589)				- 0.154*** (0.0298)	
Housing and other ($t - 1$)				- 0.119** (0.0508)				- 0.212*** (0.0287)
Fiscal burden ($t - 1$)	0.0711 (0.0685)	0.292*** (0.0842)	0.388* (0.227)	- 0.516* (0.286)	- 0.0685 (0.0965)	- 0.110 (0.0734)	- 0.00139 (0.0901)	0.283 (0.190)
Fiscal burden growth	0.114 (0.0981)	0.156 (0.103)	0.441 (0.313)	- 1.377*** (0.441)	0.0118 (0.180)	0.144 (0.146)	0.278* (0.176)	0.278 (0.363)
Per capita income (GDPpc) (logged) ($t - 1$)	0.0460 (0.0411)	0.0621 (0.0425)	0.0337 (0.125)	- 0.0863 (0.177)	- 0.0297 (0.0754)	0.0288 (0.0575)	0.0238 (0.0682)	0.245* (0.145)
Per capita income growth	- 0.203 (0.335)	- 0.115 (0.361)	0.443 (1.101)	3.043** (1.542)	- 0.227 (0.428)	- 0.743** (0.350)	- 0.618 (0.422)	1.736** (0.871)
Trade (%GDP) ($t - 1$)	0.0923*** (0.0240)	0.0750*** (0.0269)	- 0.0454 (0.0717)	- 0.190* (0.102)	- 0.0713 (0.0514)	- 0.0120 (0.0409)	- 0.152*** (0.0546)	0.182* (0.100)
Trade growth	- 0.214** (0.0843)	0.102 (0.0935)	- 0.0569 (0.273)	- 0.720* (0.393)	- 0.321* (0.177)	0.106 (0.146)	- 0.223 (0.175)	- 0.493 (0.364)
Foreign direct investment flows (%GNI) ($t - 1$)	0.0442** (0.0204)	0.00370 (0.0215)	0.0298 (0.0637)	- 0.0386 (0.0949)	0.0224 (0.0277)	0.0222 (0.0187)	0.0118 (0.0220)	- 0.0304 (0.0462)

Table 6 continued

Variables	1990–2000				2001–2012			
	(1) Education	(2) Health	(3) Social Security	(4) Housing and Other	(5) Education	(6) Health	(7) Social Security	(8) Housing and Other
Foreign Direct Investment growth	0.0235* (0.0149)	0.0110 (0.0160)	0.0155 (0.0477)	0.105 (0.0692)	0.0178 (0.0232)	-0.00562 (0.0178)	-0.0193 (0.0213)	0.135*** (0.0443)
External debt (%GNI) (<i>t</i> -1)	-0.0977** (0.0464)	-0.0855* (0.0491)	-0.205 (0.145)	-0.166 (0.206)	0.0696 (0.0712)	0.00660 (0.0442)	0.0270 (0.0538)	-0.00113 (0.110)
External debt growth	-0.0845 (0.0665)	-0.213*** (0.0719)	-0.0489 (0.216)	0.153 (0.301)	0.000230 (0.112)	-0.109 (0.0877)	0.0816 (0.107)	0.323 (0.219)
Interest payments on debt (<i>t</i> -1)	-0.0228 (0.0272)	-0.0582* (0.0309)	-0.0895 (0.0911)	0.233* (0.127)	0.0278 (0.0360)	-0.0232 (0.0285)	-0.0111 (0.0333)	0.101 (0.0721)
Interest payments on debt growth	-0.0490* (0.0283)	-0.0743** (0.0301)	0.131 (0.0918)	0.0326 (0.129)	-0.00533 (0.0420)	-0.0153 (0.0341)	-0.0847** (0.0412)	0.0335 (0.0864)
Unemployment (<i>t</i> -1)	0.00934 (0.0323)	0.0372 (0.0335)	0.147 (0.103)	-0.0313 (0.143)	-0.152** (0.0602)	-0.0355 (0.0428)	-0.0314 (0.0523)	-0.0247 (0.107)
Unemployment growth	-0.0616 (0.0456)	-0.114** (0.0505)	0.184 (0.150)	-0.0944 (0.215)	-0.101 (0.0977)	0.00849 (0.0773)	0.128 (0.0929)	0.252 (0.192)
Population over 65 (<i>t</i> -1)	-0.237*** (0.0796)	-0.0572 (0.0732)	0.306 (0.219)	-0.267 (0.317)	0.0708 (0.130)	0.0394 (0.102)	0.149 (0.128)	-0.457* (0.255)
Population over 65 growth	1.864 (2.682)	-6.221** (2.889)	-7.004 (9.232)	2.479 (12.96)	0.337 (1.828)	0.0121 (1.609)	-0.740 (1.906)	2.840 (4.027)
Democracy (<i>t</i> -1)	0.0488* (0.0262)	0.0312 (0.0266)	0.0460 (0.0792)	-0.0344 (0.113)	-0.103** (0.0515)	-0.00736 (0.0388)	-0.140*** (0.0458)	0.0414 (0.0970)
Democracy growth	-0.0193 (0.0363)	-0.109*** (0.0391)	-0.172 (0.118)	0.0364 (0.166)	-0.0994 (0.0759)	-0.0297 (0.0628)	0.0949 (0.0763)	-0.0914 (0.158)
Right-wing party (<i>t</i> -1)	-0.0174 (0.0237)	-0.0445* (0.0273)	-0.0564 (0.0774)	-0.00594 (0.125)	0.0274 (0.0314)	0.0445* (0.0265)	0.0455 (0.0347)	-0.0599 (0.0662)

Table 6 continued

Variables	1990–2000			2001–2012				
	(1) Education	(2) Health	(3) Social Security	(4) Housing and Other	(5) Education	(6) Health	(7) Social Security	(8) Housing and Other
Right-wing party growth	- 0.0303 (0.0425)	- 0.0507 (0.0464)	0.141 (0.139)	0.261 (0.198)	0.0265 (0.0757)	- 0.0340 (0.0615)	0.0104 (0.0762)	- 0.103 (0.153)
Constant	0.0749 (0.361)	- 0.924** (0.431)	- 0.506 (1.212)	3.806** (1.675)	0.818 (0.815)	0.172 (0.611)	0.502 (0.747)	- 2.774* (1.515)
Observations	163	163	163	163	186	186	186	186
Number of countries	17	17	17	17	17	17	17	17
N	163	163	163	163	186	186	186	186
ar1p	0	0	0	0	0	0	0	0
ar2p	0.501	0.194	0.798	0.870	0.330	0.166	0.411	0.733
Sarganp	0.333	0.129	0.616	0.235	0.318	0.0889	0.199	0.00869
Difference in Sargan	0.762	0.212	0.558	0.773	0.653	0.965	0.719	0.437

Lagged levels of social expenditures, GDPpc, unemployment fiscal burden and external debt (dated t - 2 and earlier) in the first— differenced equations for the first-differenced GMM estimator. For the system GMM estimator, lagged first differences of the endogenous variables (dated t - 2 and earlier) are used as additional instruments in the level equations. Year dummies are included in each model (not shown). Asymptotically robust standard errors are reported in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1

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