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Inequality, social capital, and varieties of capitalism in Latin America

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ABSTRACT

This paper aims to research whether the varieties of capitalism impact the relationship between social capital and inequality in developed economies (coordinated and liberal economies) and Latin America (hierarchical economies) in the period from 2000 to 2016. To do that, the study uses a panel analysis of developed economies and Latin America, that is, a fixed effect panel static analysis. The model includes one dependent variable (Gini index) and ten independent variables (generalised trust, informal economy, years of schooling, union density, market capitalization, annual gross domestic product, gross domestic product per capita, health expenditure, feminine labour force, and gross capital). The findings show that the relationship between inequality and social capital is negative and significant and that hierarchical economies (Latin America) amplified such a relationship.

1. Introduction

Latin America is the region with the greatest inequality in the world – even higher than sub-Saharan Africa (The World Bank, 2004). This fact is not new and is explained by a large number of factors, ranging from socio-cultural to economic. Piketty (2014) pointed out that the main cause of the increase in inequality, in the medium and long run, is an interest rate that is higher than economic growth, which applies to Latin America, as the increase in inequality in the last four decades coincides with low economic growth in the region. Other explanations include the role of inclusive institutions in reducing inequality (Hartmann et al., 2017). Putnam (2000) analysed the impact of social capital on income inequality, while several studies found that an increase in generalised trust negatively affects inequality (Delhey & Newton, 2005; Kawachi et al., 1997; Knack & Keefer, 1997; Wilkinson & Pickett, 2009).

The analysis of the relationship between inequality and social capital is important because it links aspects that occur in the labour market with the trust of individuals

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to the rest of society. In this way, if workers, through the labour unions, intervene, directly or indirectly, in the setting of salaries, the wage gap will tend to be smaller. The latter has two effects – on the one hand, a reduction in inequality, and on the other hand, an increase in the workers' trust because they feel that they are part of the firm decision-making. Overall, the relationship between social capital and inequality shows the institutional choices that society makes in relation to the varieties of capitalism.

In the literature on varieties of capitalism, Hall and Soskice (2001) concluded that institutional competitive advantages are a consequence of institutional complementarities. These authors consider that there are two ways in which companies solve their coordination problems. One is through formal institutions, that is, written laws, contracts, etc. Another is through informal institutions. The first case of such varieties of capitalism involves the Liberal Market Economies (LMEs), with institutional competitive advantages in services. In this case, the model country is the United States. The second case is the Coordinated Market Economies (CMEs), with institutional competitive advantages in advanced manufactures. In this case, the model country would be Germany. In the first case, there are radical innovations and workers do not intervene in the firm decision-making. Meanwhile, in the second case, there are incremental innovations with workers in the firm decision-making. With regard to Latin America, Schneider (2009) pointed out that the model of Hall and Soskice (2001) cannot be applied in developing countries because organisations assume the role of institutions. Schneider (2013) pointed out that Latin America has Hierarchical Market Economies (HMEs), with the following organisations: 'diversified business groups, multinationals, low-skilled labour and atomistic labour relations' (p. 553).

Previous studies have not considered the impact of the varieties of capitalism on the relationship between social capital and inequality. This is important because in these three types of capitalism (LMEs, CMEs, and HMEs), the different institutional complementarities and institutional comparative advantages mean that the wage gap and generalised trust vary.

We argued that, to analyse the relationship between inequality and social capital, it is necessary to consider the varieties of capitalism, that is, whether countries are CMEs, LMEs, or HMEs. Thus, in the case of Latin America, the relationship between inequality and social capital is different from the relationships in other varieties of capitalism because the organisations that Schneider pointed out have permeated this relationship, unlike formal (LMEs) and informal (CMEs) institutions. The paper aims to show that the relationship between social capital and inequality is affected by the varieties of capitalism and that, in the Latin America case, its HMEs have a direct effect on this relationship. To do the above, we analyse LMEs, CMEs, and HMEs through the fixed effects panel data model, which estimates the effect of generalised trust, a set varieties of capitalism variables, and the Gini index, to determine whether the relationship between the previous variables is affected by the varieties of capitalism.

The findings show that the relationship between generalised trust and the Gini index is amplified in HMEs. Furthermore, union density, years of schooling, informal economy, and market capitalization affect inequality.

2. Literature review

The study aims to examine the effect of the varieties of capitalism on the relationship between social capital and income inequalities in Latin America. Most authors have observed the existence of a negative correlation between income inequalities and social capital. Other studies argue the null relationship between both variables when control variables are included. However, such papers do not consider how the institutional configuration (varieties of capitalism) influences this relationship. Those studies are characterised by differences of sample analysis in countries, econometric techniques, control and instrumental variables, and the selected analysis periods.

Overall, several empirical studies, developed in recent years, are presented (see Table 1). Such studies are classified into two groups. The first group shows papers that confirm the effect of social capital, ethnic diversity, and race on income inequalities. The second group shows results that confirm the null relationship between both variables.

The first group describes the results in the relationship between social capital and income inequalities. Within this group are papers at the regional level. For example, Putnam (2000) pointed out that aspects such as suburbanisation, the pressures of time and money, incorporating females into the labour market, generational change, and technology negatively impact social capital, concluding that states with high social capital generate income equality that diminishes economic disparities.

Narayan and Pritchett (1999) considered that societies have exogenous factors – such as social capital, education, assets, and the gender of the head of the family – that have a positive effect on household income. When the members of communities have associative and communal relations, they provide access to different services and economic improvement.

Subsequent studies confirmed that an increase in social capital increases average earnings (Robison et al., 2011). According to Ram (2013), when such a relationship is analysed in a labour context, generalised trust creates a sense of honesty and respect by the receipt of compensation that helps mitigate wage inequalities. Similar results occur with the inclusion of explanatory variables such as polarisation and race and ethnic diversity (Alesina & La Ferrara, 2000; Costa & Kahn, 2003; Ivarsflaten & Strømsnes, 2013; Paarlberg et al., 2018; Wright, 2015).

Other studies conducted analyses at the transnational level. For instance, Kawachi et al. (1997) showed that the wage gap between rich and poor generates disinvestment in generalised trust and in community participation, causing an increase in mortality among the countries. Meanwhile, homogenous ethnicities and high educational levels develop strong trust and dense civic norms.

Delhey and Newton (2005) determined that there is no causal relationship between generalised trust and wage inequalities. However, they argue that economies with high interpersonal trust have ethnic homogeneity, government effectiveness, national wealth, and income equality. Similarly, Wilkinson and Pickett (2009) studied various well-being measures in developed countries and concluded that countries with high income inequality have levels of interpersonal trust of 15%, while countries with low income inequality have trust of around 60–65%.

Table 1. Comparative studies: Social capital and economic inequalities.

Authors	Sample	Database	Methodology	Inverse effect of social capital on income inequalities
● First group of papers: Negative correlation of social capital and economic inequalities				
Putnam (2000)	U.S. communities	Not specified	Estimation method: OLS	Societies with greater social capital have lower income inequality.
Knack and Keefer (1997)	29 market economies	World Values Surveys	Cross-sectional data Estimation method: OLS, 2SLS	Countries with fair incomes have greater trust and dense civic norms.
Kawachi et al. (1997)	39 states	General Social Survey (GSS)	Cross-sectional data Estimation method: OLS	There is an inverse effect of inequalities of income to social capital.
Narayan and Pritchett (1999)	Rural communities in Tanzania (1,376 households in 87 groups)	Social Capital and Poverty Survey (SCPS)	Cross-sectional data Estimation method: OLS	High social capital in the communities has a causal effect on the economic performance of households.
Alesina and La Ferrara (2000)	U.S. communities	General Social Survey (GSS) The Current Population Survey (CPS)	Cross-sectional data Estimation method: Multivariate analysis	Societies with high disparities of income, ethnic diversity and race show low social participation.
Costa and Kahn (2003)	U.S. communities	American National Election Study Current Population Survey (CPS) General Social Survey (GSS)	Cross-sectional data Estimation method: Probit analysis	Higher income inequalities have a negative effect on social capital.
Delhey and Newton (2005)	60 countries	World Values Survey (WVS)	Cross-sectional data Estimation method: OLS	Countries that are characterised by ethnic homogeneity, wealth, good governance, religious traditions and economic equality improve social trust.
Uslaner and Brown (2005)	U.S. state level	General Social Survey (GSS) The Roper Social Political Trends Archive	Aggregated data Estimation method: OLS	Income inequalities have a negative effect on trust and participation.
Bjørnskov (2007)	76 countries	World Values Survey (WVS)	Cross-sectional data Estimation method: OLS	Economic inequalities and ethnic diversity permeate trust.
Wilkinson and Pickett (2009)	25 countries	Not specified	Cross-sectional data Estimation method: Simple bivariate correlations	Economic disparities have a negative effect on generalised trust.
Robison et al. (2011)	50 U.S. states	Not specified	Cross-sectional data Estimation method: OLS	Capital changes affecting trade, impacting income distribution.
Ram (2013)	United States	Compilation of Bjornskov American Community Survey (ACS) American Factfinder	Cross-sectional data Estimation method: OLS	In the employment context, social trust mitigates income inequalities.
Ivarsflaten and Strømsnes (2013) Olivera (2015)	99 communities in Norway	TNS Gallup	Cross-sectional data Estimation method: Multilevel analysis	Norway shows a high variation in income inequalities that impact social trust.

(continued)

Table 1. Continued.

Authors	Sample	Database	Methodology	Inverse effect of social capital on income inequalities
	34 European countries	ESS survey Europe SWIID version 4.0 World Development Indicators	Data panel Estimation method: Multilevel and fixed-effects model	The multilevel model shows a negative relationship between income inequality and social capital; however, when a fixed-effects model is applied, the variables have no significance.
Wright (2015)	United States	Surveys Monitoring the Future (MtF)	Cross-sectional data Estimation method: Ordered probit regression and OLS	Economic inequalities increase the ratio of capital and the socioeconomic status of the parents.
Gallego (2016)	Netherlands	Longitudinal studies of Internet for Social Sciences (LISS)	Cross-sectional data Estimation method: OLS	Income inequalities affect trust and cooperation of the lowest-income quintiles.
Barone and Mocetti (2016)	60 countries	World Bank Global Maximum Income Database (Atkinson and Piketty, 2010) World Values Survey	Data panel Estimation method: OLS and 2SLS fixed-effects model	Developed countries show an inversely proportional connection between social capital variables and income inequalities.
Paarlberg et al. (2018)	U.S. counties	Not specified	Cross-sectional data Estimation method: OLS	Greater income inequality and ethnic diversity generate negative effects on social capital.
Authors	Sample	Database	Methodology	Null effect of social capital on income inequalities
• Second group of papers: Null correlation of social capital and economic inequalities				
Steijn and Lancee (2011)	18,119 people nested in 20 countries.	The Survey Program (ISSP) Eurostat European Social Survey	Cross-sectional data Estimation method: Multilevel logistic and linear models	Economic inequality has no significant effect on generalised trust by including the variable of national wealth.
Fairbrother and Martin (2013)	U.S. counties	General social survey	Cross-sectional and longitudinal data Estimation method: Multilevel and regression logistic models	Studies with cross-sectional data show the association of income inequalities and trust. The longitudinal results show no relationship.
Ioakimidis and Heijke (2016)	17 European countries	Eurostat European Social Survey (ESS) CIA World Factbook World Bank	Cross-sectional data Estimation method: OLS and fixed-effects model	There is no correlation between income inequalities and social capital when including dummy and control variables.
Liu et al. (2017)	United States	Putnam Index	Cross-sectional data Estimation method: OLS	The disparity of income increases with racial diversity. Social capital evidences no relationship to economic inequalities.

Source: processed and elaborated by authors.

Barone and Mocetti (2016) conducted a quantitative econometric study of 60 post-industrial and developing countries, using different variables to quantify income inequalities, control variables, and instrumental variables. They concluded that there is a correlation between income inequalities and generalised trust for developed countries but that this effect is not significant for developing regions (Bjørnskov, 2007; Gallego, 2016; Olivera, 2015).

The second group of studies found no relationship between capital and income inequalities. Fairbrother and Martin (2013) conducted quantitative research through cross-sectional and longitudinal data in various counties of the United States. In analysing the cross-sectional data, the study showed the causal effect of income inequality and social capital, although this was not the case with the longitudinal data.

Similar results occurred in Ioakimidis and Heijke (2016). They argued that socio-cultural factors affect the relationship between income inequality and social capital. In their research, they applied multiple regressions for 17 European countries, using the type of regime, GDP per capita, education, percentage of urbanisation, and government spending. The results confirmed that income inequalities do not affect generalised trust. The previous variable is related to the democratic regime (Liu et al., 2017; Steijn & Lancee, 2011).

The previous research examined the correlational and causal relationship of civic participation, social trust, and economic disparities. However, no research examines how such an effect varies by including the institutional configuration of capitalism. We argue that the reduction of social capital (generalised trust) means that various economic actors do not achieve joint profits, benefiting certain interest groups, such as managers, owners, and investors (elite groups), and generating an increase in inequalities of income in HMEs.

3. Data and methodology

3.1. Data

To demonstrate whether capitalism varieties negatively affect the relationship between social capital and income inequalities for HMEs, we examined longitudinal data from spatial and temporal dimensions. Because dimension had the same number of observations, we used a balanced data panel with effects fixed for 29 countries. This analysis was applied from 2000 to 2016. The sample was divided into three varieties of capitalism. Thirteen of the countries were classified, according to Schneider and Karcher (2010), as HMEs. Another 16 economies were divided using Hall and Soskice's scheme; six fell into LMEs and 10 fell into CMEs. Table 2 shows these classifications.

Regarding variables, income inequalities were analysed like dependent variable. Previous research shows how the decrease in generalised trust and low participation in networks contributed to greater income inequalities. In terms of the income distribution channel, it was analysed in a manner similar to that of various international investigations (Berisha & Meszaros, 2018; Mishra, 2018; Mouw, 2003; Pedauga et al., 2017).

Table 2. Countries by type varieties of capitalism.

Varieties of capitalism	Countries
Hierarchical Market Economies (HMEs)	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Panama, Paraguay, Peru, and Uruguay.
Liberal Market Economies (LMEs)	Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States.
Coordinate Market Economies (CMEs)	Austria, Belgium, Denmark, Finland, Germany, Japan, Netherlands, Norway, Sweden, and Switzerland.

Source: As suggested by Hall and Soskice (2001) and Schneider and Karcher (2010).

We used the data on the standardised global income inequality data (SWIID). The missing data were estimated using the cross-section multiple imputation method. We used the Gini index, which represents the distribution of income in the family market (before taxes and transfers), published in the 2014 version of the SWIID project (Solt, 2016). The coefficient assumes values from 0 (perfect equality) to 100 (perfect inequality). As noted by Solt (2016), SWIID maximises comparability between countries and extended periods of available information on income inequalities.

Generalised trust was regarded as the independent variable. Several papers measure social capital from a multidimensional perspective, using variables such as social trust, participation in networks, and informal social norms (Hawes et al., 2013; Keele, 2005). However, current international research uses generalised trust as a social capital (Barone & Mocetti, 2016; Olivera, 2015). Generalised trust data were obtained from three databases: Latinobarómetro (2018), which provided information for the Latin economies, the World Values Survey (2018), and the European Social Survey (2018), which includes data for European countries. In the case of missing data, the cross-section multiple imputation method was implied. The World Values Survey and the Latinobarómetro apply the same question: Would you say most people can be trusted, or should you be very careful when dealing with people? The possible answers are I) Most people can be trusted, II) I need to be very careful, III) No answer, and IV) Does not know. The weighting was performed with the percentage of people who believe they can trust most people, to determine the annual trust between countries. ESS considers the following question: Would you say that you can trust most people, or that you cannot be too careful when dealing with people? The answers range from 0 to 10. A score of 0 implies lower confidence, while 10 implies greater confidence. We use the sum of the percentage of the scale of the responses from 6 to 10.

For the case of variables related to varieties of capitalism, we used the country scheme proposed by Hall and Soskice (2001), Schneider and Karcher (2010) and Borges et al. (2020). CMEs carry out wage negotiations with the intervention of employers' associations and the labour union. Financing is based on their business networks and banks. Skill development is characterized by the acquisition of specific skills. The informal economy is low compared to hierarchical economies. LMEs base the coordination of labour relations on the market; therefore, union participation and union bargaining are low. Education and vocational training are general; corporate governance focuses on managers for decision-making. This type of economy has low

levels in the informal economy. HMEs have a high informal labour market. Therefore, labour relations have fluid and short-term links between the company and workers and union participation is low. In addition, workers have limited skills and there is little development of financial markets.

We examined how institutional indicators condition the effects of social capital and income inequalities. In particular, we studied how the indicator of labour relations (union density) influences the effect of social capital. Union density measures the number of workers affiliated with unions, expressed as a percentage of the total number of workers. Data on union density is drawn from the International Labour Organization (2018), Visser (2016), and the Organization for Economic Co-operation and Development (2018). Missing data were calculated using the cross-sectional multiple imputation method. Another indicator was the informal economy. This variable means self-employed workers. Informal economy data were obtained from World Development Indicators (WDI 2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). The stock market capitalisation was obtained from WDI (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). Finally, we studied the years of schooling (average); this variable was obtained from Human Development Reports (2018).

The following control variables were considered: GDP growth per capita (annual %) and GDP per capita (Ishak, 2008; Royuela et al., 2019; Saucedo Acosta et al., 2016). GDP per capita means the total gross domestic product in dollar rates using purchasing power parity, while GDP growth reflects the annual percentage growth rate of GDP per capita. These data were obtained from WDI (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). Additionally, we used a control variable related to the concept of social expenditure: health expenditure. Health spending measures the services that are invested in health annually. Health spending data were obtained from WDI (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). Another control variable was the feminine labour force. Studies have shown that gender inequalities can increase wage gaps (Ukhova, 2015). Therefore, the feminine labour force was used as a control variable. The data were extracted from the WDI (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). Finally, we used gross capital formation as a control variable. This reflects the investment in fixed assets, such as improvements in land, roads, schools, and transportation, among others. Data on gross capital formation were drawn from the WDI (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g). Table 3 provides a brief description of the analysis variables.

Table 4 shows a summary of selected data. The standard deviation indicates considerable heterogeneity. However, in the context of the analysis of temporal dimensions, the existence of such a variation is a good prerequisite for econometric analysis, as evaluating the impact of the independent variables (Buterin et al., 2017).

3.2. Estimation strategy

3.2.1. Correlation analysis
It is important to include the relationship between the dependent variable and the explanatory and control variables because the correlation analysis shows that the

Table 3. Variables included in the analysis.

Dependent variable		
Variable name	Description	Data source
Gini index	Distribution of income in the family market.	Standardised Global Income Inequality Data (SWIID)
Independent variables		
Generalised trust	Percentage of trust between people.	Latinobarometro World Values Survey European Social Survey
Labour union	Percentage of workers affiliated to trade unions.	International Labour Organization the ICTWSS Organization for Economic Cooperation and Development
Informal economy	Workers who are self-employed	World Development Indicators
Years of schooling	Mean years of schooling	Human Development Reports
Market capitalisation	Value of listed shares to GDP	World Development Indicators
Control variables		
Feminine labour force	Labour participation rate, women	World Development Indicators
GDP growth per capita (annual%)	Annual percentage growth rate of GDP per capita in local currency, at constant prices	World Development Indicators
GDP per capita	Gross domestic product converted to international dollars using purchasing power parity rates	World Development Indicators
Gross capital formation	Outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	World Development Indicators
Health expenditure	Current health expenditure expressed as a percentage of GDP	World Development Indicators

Source: European Social Survey (2018); Human Development Reports (2018); International Labour Organization (2018); Latinobarómetro, (2018); Organization for Economic Co-operation and Development (2018), The ICTWSS (Visser, 2016), World Development Indicators (2018a, 2018b, 2018c, 2018d, 2018e, 2018f, 2018g); World Values Survey (2018), processed and elaborated by authors.

variables are interconnected. However, the coefficient value should never be 1, which indicates that the variables have the same information.

Table 5 shows the correlation analysis of our study variables. The first segment refers to the relationship between the dependent and explanatory variables. It can be seen that most of the variables used in the model are correlated with each other and that their relationship with the dependent variable is negative. This is in line with what was expected when analysing the set of variables. However, such a negative relationship does not occur with the informal economy variable (E). Studies consider that developing economies with high levels of poverty and economic inequalities have higher levels of informal economy (E) (Chen, 2016; Dasgupta & Lloyd-Jones, 2018). On the order hand, the relationship between generalised trust (T) and the informal economy (E) is high and negatively correlated. In this sense, it is reasonable to observe that societies that have high levels of an informal economy (E) are associated with lower levels of social trust. This relationship is possible when societies have power relations and extractive institutions (Coletto et al., 2018).

The least related variables are union density (W) and market capitalisation (M). The second segment in Table 5 refers to the control variables. GDP per capita

Table 4. Summary statistics by varieties of capitalism.

	N	Mean	SD	Min	Max
Overall					
Gini index	493	39.30	10.24	21.80	61.60
Generalised trust	493	36.96	21.54	2.40	82.80
Informal economy	493	24.50	14.06	6.96	60.45
Years of schooling (average)	493	10.27	2.27	5.20	14.10
Union density	493	25.62	19.56	1.10	80.11
Market capitalisation	493	42.87	57.15	0.00	313.59
Control variables					
Feminine labour force	493	63.64	9.67	39.36	80.33
Annual GDP	493	1.76	2.87	−11.88	24.38
GDP per capita	493	29.28	16.77	4.40	65.08
Gross capital	493	22.01	4.32	10.85	44.31
Health expenditure	498	8.24	2.25	3.32	16.84
CME					
Gini index	170	29.14	3.00	21.80	41.30
Generalised trust	170	56.20	15.83	27.70	82.80
Informal economy	170	12.46	2.84	6.96	18.45
Years of schooling (average)	170	11.98	1.04	9.00	14.10
Union density	170	42.65	22.41	14.53	80.11
Market capitalisation	170	70.40	49.88	3.34	255.01
Control variables					
Feminine labour force	170	70.76	6.18	54.31	80.33
Annual GDP	170	1.02	2.10	−8.71	5.60
GDP per capita	170	44.55	7.85	33.87	65.08
Gross capital	170	22.76	2.20	18.07	29.32
Health expenditure	170	9.46	1.15	6.84	12.06
LME					
Gini index	102	33.61	2.3	29.10	38.90
Generalised trust	102	47.08	13.33	11.20	68.20
Informal economy	102	15.58	2.90	9.86	20.71
Years of schooling (average)	102	12.28	0.62	10.80	13.40
Union density	102	23.44	7.35	10.30	36.37
Market capitalisation	102	80.28	75.41	1.77	313.59
Control variables					
Feminine labour force	102	68.55	4.31	55.57	74.98
Annual GDP	102	1.68	3.05	−5.87	24.38
GDP per capita	102	41.07	6.72	27.62	63.23
Gross capital	102	22.38	3.85	14.43	32.68
Health expenditure	102	9.78	2.76	5.91	16.84
HME					
Gini index	221	49.73	4.62	39.70	61.60
Generalised trust	221	17.48	6.99	2.40	43.60
Informal economy	221	37.87	10.16	20.97	60.45
Years of schooling (average)	221	8.07	1.12	5.20	10.30
Union density	221	13.53	8.44	1.10	42.00
Market capitalisation	221	4.43	7.86	0.00	38.83
Control variables					
Feminine labour force	221	55.91	7.79	39.36	75.03
Annual GDP	221	2.36	3.16	−11.80	9.98
GDP per capita	221	12.12	4.53	4.40	22.61
Gross capital	221	21.39	5.50	10.85	44.31
Health expenditure	221	6.60	1.35	3.32	10.40

Source: processed and elaborated by authors.

(GDPPC) is the highest related variable with the Gini index, and in a related positive with all the explanatory variables. Annual GDP (AGDP) and gross capital (GC) are the least correlated with the dependent and explanatory variables.

Table 5. Correlation matrix.

	Explanatory variables						Control variables				
	GINI	T	E	S	W	M	FLF	AGDP	GDPPC	GC	HE
GINI	1										
T	−0.8417	1									
E	0.8344	−0.7328	1								
S	−0.8426	0.7381	−0.8483	1							
W	−0.6672	0.7324	−0.6318	0.4754	1						
M	−0.4850	0.3846	−0.5564	0.6140	0.2359	1					
FLF	−0.6909	0.7388	−0.5650	0.7254	0.5076	0.5094	1				
AGDP	0.1776	−0.1793	0.1779	−0.1561	−0.1312	−0.1690	−0.1295	1			
GDPPC	−0.8630	0.7906	−0.8740	0.9039	0.5526	0.6157	0.7061	−0.1608	1		
GC	−0.1492	0.1207	−0.1064	0.2067	0.0184	0.0378	0.0350	0.2334	0.2261	1	
HE	−0.5781	0.3927	−0.6949	0.6892	0.2325	0.6407	0.4916	−0.2250	0.7110	0.0313	1

	Explanatory variables CME						Control variables				
	GINI	T	E	S	W	M	FLF	AGDP	GDPPC	GC	HE
GINI	1										
T	−0.3013	1									
E	0.3150	−0.5300	1								
S	0.1310	0.2017	−0.3406	1							
W	−0.6170	0.6470	−0.4839	−0.1304	1						
M	0.2266	0.1673	0.2010	0.1431	−0.0653	1					
FLF	0.0035	0.7584	−0.4889	0.5898	0.2918	0.3349	1				
AGDP	0.0429	−0.0096	−0.0073	−0.1329	0.0487	0.0090	−0.0422	1			
GDPPC	0.2400	0.4594	−0.3751	0.4157	−0.0308	0.0233	0.5781	−0.0531	1		
GC	−0.0070	−0.0470	0.0592	−0.2549	0.0430	0.1251	−0.0822	0.1337	0.2952	1	
HE	0.2063	−0.1753	0.0832	0.5250	−0.3895	−0.1209	0.2037	−0.2290	0.1634	−0.301	1

	Explanatory variables LME						Control variables				
	GINI	T	E	S	W	M	FLF	AGDP	GDPPC	GC	HE
GINI	1										
T	−0.6924	1									
E	−0.7881	0.6963	1								
S	0.4353	−0.4739	−0.6414	1							
W	−0.5755	0.5486	0.4261	−0.5769	1						
M	0.6186	−0.7790	−0.7670	0.6748	−0.6125	1					
FLF	−0.1567	0.2667	−0.1241	0.3922	−0.2581	0.1234	1				
AGDP	−0.0737	−0.0009	−0.1241	−0.2336	0.0845	−0.2066	−0.2804	1			
GDPPC	0.3309	−0.6166	−0.4547	0.4608	−0.2543	0.4675	−0.3369	0.2005	1		
GC	−0.4119	0.2029	0.5222	−0.2324	−0.0334	−0.2706	−0.0968	0.1413	0.1687	1	
HE	0.6477	−0.7158	−0.7145	0.6838	−0.6830	0.7450	0.0820	−0.2097	0.6302	−0.2007	1

	Explanatory variables HME						Control variables				
	GINI	T	E	S	W	M	FLF	AGDP	GDPPC	GC	HE
GINI	1										
T	−0.3966	1									
E	0.2336	−0.1106	1								
S	−0.3951	0.1179	−0.4112	1							
W	−0.2016	0.1562	−0.6659	0.2998	1						
M	0.1944	−0.3678	−0.2140	−0.0504	0.1542	1					
FLF	−0.0708	−0.0028	0.3271	0.0782	0.0709	−0.0563	1				
AGDP	−0.0395	−0.0655	0.0064	0.1590	−0.0828	−0.0244	0.1211	1			
GDPPC	−0.3616	0.0680	−0.6298	0.6677	0.4604	0.3451	−0.1441	0.0669	1		
GC	0.0134	−0.0908	−0.0098	0.4027	−0.3181	−0.0005	−0.1151	0.3480	0.3641	1	
HE	−0.2196	−0.0445	−0.5030	0.0491	0.2182	0.2080	−0.0602	−0.0622	0.3817	0.0334	1

Source: processed and elaborated by authors.

3.2.2. Panel data

Panel analysis is a method that takes observations of time on different units, regularly with a smaller range of time series data, which is suitable for setting up this model.

The most used methods in these cases (with a small temporal or spatial dimension) are the methods of fixed and random effects. We used balanced data for 29 countries over 17 years. The missing data were estimated using a multiple imputation model proposed for time-series cross-section data by Honaker and King (2010). Overall, the decision was made to compare three different models.

The shape of the models used here is as follows:

$$y_{it} = \alpha_i + \Psi \begin{bmatrix} T_{it} \\ E_{it} \\ S_{it} \\ W_{it} \\ M_{it} \end{bmatrix} + \varepsilon_{it} \tag{1}$$

$$y_{it} = \alpha_i + \Psi \begin{bmatrix} T_{it} \\ E_{it} \\ S_{it} \\ W_{it} \\ M_{it} \end{bmatrix} + G \begin{bmatrix} HME \\ LME \end{bmatrix} + \varepsilon_{it} \tag{2}$$

$$y_{it} = \alpha_i + \Psi \begin{bmatrix} T_{it} \\ E_{it} \\ S_{it} \\ W_{it} \\ M_{it} \end{bmatrix} + \Pi \begin{bmatrix} FLF_{it} \\ APIB_{it} \\ PIBPC_{it} \\ GC_{it} \\ HE_{it} \end{bmatrix} + \varepsilon_{it} \tag{3}$$

where Ψ, Π, and G are the vectors of regression coefficients measuring the association of the dependent variable Gini index (y_{it}) with the explanatory variables, T_{it} is the generalised trust, E_{it} is the informal economy, S_{it} is the years of schooling, W_{it} is the union density, and M_{it} is the market capitalisation. In the second model, HME and LME are the estimation of the slope differences with regard to CME. The third model included the following control variables: feminine labour force(FLF_{it}), annual GDP($AGDP_{it}$), GDP per capita ($GDPPC_{it}$), gross capital (GC_{it}), and Health expenditure (HE_{it}).

When α_i is correlated with regressors, a model of fixed effects (FEM) is more appropriate. On the other hand, when the distribution of α_i is normal, the method of random effects (REM) is better.

The estimation of the models was made using a fixed effect transformation, also called within transformation. This estimation method 'uses the time-demeaning on each explanatory variable including things like time-period dummies – and then do a pooled OLS regression using all time-demeaned variables' (Wooldridge, 2013, p.485). The fixed effects model (a.k.a. within or least squares dummy variables), usually estimated by OLS on transformed data, and gives consistent estimates for β. The package PLM of R, version 3.6.2, make a transformation of the data: $P = \frac{1}{T} I_n \otimes jj'$, $Q = I_{nT} - P$, where $_T$ is the time periods, $_n$ is the number of individuals, j a vector of one length $_T$ and In the

identity matrix. It returns a vector containing the values in deviation from the individual means (Croissant & Millo, 2008).

The fixed effect transformation is unbiased, under an exogeneity assumption on the explanatory variables (Wooldridge, 2013). It was used the Hausman test or Durbin Wu Hausman test, to test the exogeneity assumption, and the model fixed effect was chosen over the random effect.

In the model 2, variables of varieties of capitalism were added, which show the interaction with the generalized trust. The model 3 includes control variables, in order to corroborate the consistency of the model, given the limitation that the Hausman test (Vinod, 2019).

4. Results

Figure 1 shows some relationships between the Gini index and a set of independent variables. The first graph (upper left hand) of Figure 1 shows the relationship between inequality and generalised trust (2000–2016) for 29 countries. Overall, this graph indicates a negative relationship between the previous variables. However, the relationship is clearer among HMEs than it is among CMEs and LMEs. The second graph (upper right hand) shows that the relationship between the Gini index and the informal economy appears to be positive for the whole sample, but negative for LMEs. The third graph (middle, left hand) indicates that there is a negative relationship between inequality and years of schooling for the whole sample. However, this relationship is stronger for HMEs and appears to be negative for LMEs; for CMEs, there is no clear relationship. The fourth graph (middle, right hand) illustrates the negative relationship between the Gini index and union density for the whole sample and applied for the three groups of countries. Finally, the fifth graph (bottom, left hand) shows that there is no clear relationship between inequality and market capitalization for the whole sample or for HMEs. Nevertheless, for LMEs and CMEs, the previous relationship appears to be positive.

Table 6 shows the relationship between inequality and a group of independent variables, using a fixed-effects regression model. Model 1 shows the relationship among the inequality (Gini index) and a set of explanatory variables (generalised trust, informal economy, mean years of schooling, union density and market capitalisation). The results show a significant and negative relationship between the Gini index and generalized trust, which supports our argument. The coefficients of the varieties of capitalism variables have the expected signs: The informal economy variable is significant and positively affects inequality, while years of schooling and union density are significant and negatively affect inequality. The effect of years of schooling is higher than generalised trust and union density in reducing inequality.

In model 2, the Gini index was regressed with the same variables as in model 1, and a factor variable was introduced that estimates the effect of the generalized trust by varieties of capitalism on the relationship with inequality.

The CME was considered as a base (i.e. null correlation), HME generalized trust has a stronger negative and significant correlation with the Gini index (-0.272), while LME generalised trust is negative and significant (-0.089), but smaller than
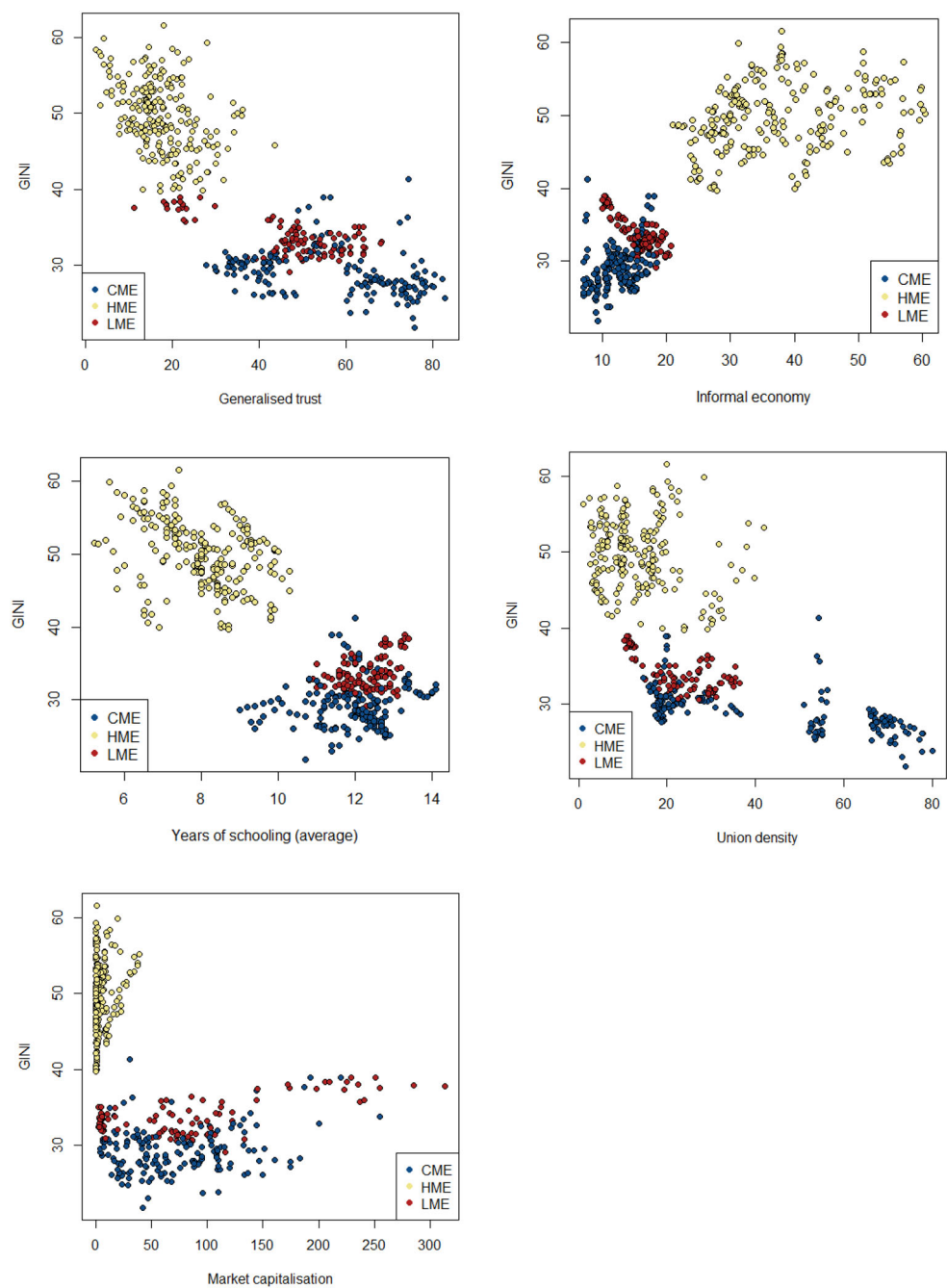
Figure 1. Plots of Gini index and independent variables, by variety of capitalism, 2000-2016. Source: Authors' calculation

HME (Figure 1), which is in line with our argument. The union density coefficient is significant and negative (−0.103) and the market capitalisation coefficient is significant and positive, which is in line with the varieties of capitalism theory. The

Table 6. Fixed effects model (FEM). Dependent variable: Gini index.

Variable	Coef.	p	s.e.
Model 1			
Generalized trust	−0.1628	0.0001	0.0171
Informal economy	0.1610	0.0001	0.0297
Years of schooling	−1.5382	0.0001	0.2028
Union density	−0.0622	0.0008	0.0156
Market capitalisation	0.0012	0.7896	0.0044
Hausman test	12.35	0.0302	
R-sq (within)	0.8316		
R-sq (between)	0.8641		
R-sq (overall)	0.8381		
F (model)	490.08	0.0001	
Observations	493		
Model 2			
Generalized trust	0.042	0.0210	0.018
Generalized trust*HME	−0.272	0.0001	0.034
Generalized trust*LME	−0.089	0.0008	0.034
Informal economy	0.003	0.9051	0.022
Years of schooling	−0.021	0.8975	0.166
Union density	−0.103	0.0001	0.012
Market capitalisation	0.008	0.0355	0.004
Hausman test	1162	0.0001	
R-sq (within)	0.9186		
R-sq (between)	0.8578		
R-sq (overall)	0.9067		
F (model)	619.35	0.0001	
Observations	493		
Model 3			
Generalized trust	−0.141	0.0001	0.021
Informal economy	0.096	0.0101	0.037
Years of schooling	−1.188	0.0001	0.236
Union density	−0.072	0.0001	0.016
Market capitalisation	0.007	0.1831	0.005
Control variables			
Feminine labour force	0.013	0.7171	0.035
Annual GDP	0.059	0.4589	0.079
GDP per capita	−0.125	0.0002	0.034
Gross capital	−0.124	0.4456	0.161
Health expenditure	−0.124	0.4429	0.162
Hausman test	19.14	0.0239	
R-sq (within)	0.8447		
R-sq (between)	0.8727		
R-sq (overall)	0.8364		
F (model)	282.34	0.0001	
Observations	493		

Source: author calculation with plm package in R, version 3.6.2.

marginal effect of generalised trust (model 2) is higher in HMEs than in CMEs and LMEs, which means that small increases in Latin American countries' generalised trust lead to high reductions in the inequality of this region.

In model 3, the Gini index was regressed with the same variables as model 1 and five control variables. The results show that the coefficient of generalised trust remains negative and significant (−0.141), which also supports our argument. The variables of years of schooling and union density have a negative and significant relationship with inequality (as in model 1), while the informal economy variable has a positive relationship with the Gini index. The GDP per capita variable has a negative relationship with inequality, which means that increases in GDP per capita tend to reduce inequality.

Overall, the three models of Table 6 show the negative effect of union density on inequality levels, while two models present the high effect of education on the reduction of inequality. The variables of varieties of capitalism indicate that the effect of generalised trust varies across the type of capitalism, and HMEs have a higher marginal effect (of generalised trust) on inequality.

5. Discussions and conclusions

The paper aimed to show how the varieties of capitalism – which for this study were HMEs, LMEs, and CMEs – affect the relationship between inequality and generalised trust. The results showed evidence that the relationship between inequality and social capital is stronger in HMEs than in LMEs/CMEs – that is, in economies with low levels of inequality, changes in generalised trust do not affect the Gini index.

The obtained results support our argument because they showed that in the cluster formed by HMEs, the relationship between inequality and social capital (generalised trust) is stronger. Latin American countries show levels of inequality ranging from a Gini index of 35 to 50, while generalised trust ranges from almost 10 to 25. The relationship is negative and stronger than CME and LME. In this sense, when a country is an HME, it tends to show a negative relationship between inequality and generalised trust.

Our results coincide with those of Putnam (2000) and Narayan and Pritchett (1999) because high levels of social capital imply low inequality, which would be the case with CMEs. These authors analysed communities and sub-national entities, while, in our case, we used countries. However, the results are the same because countries, states, and communities with high levels of social capital tend to have low levels of inequality. Ram (2013) focused on the labour context but the results are similar to those we found: High levels of generalised trust tend to decrease wage inequality.

Kawachi et al. (1997), Knack and Keefer (1997), and Delhey and Newton (2005) obtained results similar to those presented. They indirectly showed the existence of a negative relationship between inequality and social capital in an international context. Wilkinson and Pickett (2009) found quantitative results that support the idea that CMEs have high levels of social capital associated with low inequality, while HMEs are characterized by low levels of social capital and high levels of inequality. On the other hand, our results do not coincide with those of Fairbrother and Martin (2013) because, in our study, the link between inequality and generalised trust in developing countries (HMEs) is stronger than it is in developed countries (CMEs). The results obtained do not coincide with those of a group of scholars who believe that income inequalities do not affect social capital (Ioakimidis & Heijke, 2016; Liu et al., 2017; Steijn & Lancee, 2011).

The main weakness of the paper is that we used only the Gini index as a dependent variable. We could improve the econometric analysis if we include the Palma ratio and the 1% income concentration as dependent variables.

Additionally, from the results, we can consider that hierarchical capitalism generates conditions for workers to receive low salaries because the competitive advantages

are commodities and simple manufactures. This fact, on the one hand, increases income inequality between low-skilled workers and the managers and owners of companies with high profit rates. On the other hand, it reduces generalised trust because workers do not see hierarchical capitalism as fair.

The results showed that the varieties of capitalism framework affects the relationship between social capital and inequality. From the above, the following questions could arise What organisations, in the sense of Schneider (2013), most affect inequality and social capital in Latin America? Did the reconfiguration of these organisations have some effects on the fall of inequality and the increase in social capital in the 2000s in Latin America? Future research should focus on how the organisations that Schneider proposed have affected inequality and social capital in Latin America.

This paper presents new evidence to explain the relationship between inequality and social capital through the use of varieties of capitalism. The original contribution shows that in Latin America, there is hierarchical capitalism that strengthens the negative relationship between inequality and generalised trust. In the 2000s, there was a fall in inequality in most Latin American countries, which this study explains by the strong link between this variable and social capital. The original contribution of this paper can be generalised not only for Latin America but also for HMEs around the world.

Our conclusions show that the relationship between inequality and social capital is stronger in HMEs, which can be regarded as an advance in the current state of research on the determinants of inequality in Latin America.

Disclosure statement

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