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Keywords: Inequality; entrepreneurship; panel data.
JEL codes: O11; O47; C5.

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1. Introduction

In recent years, the literature on inequality has upsurged, particularly since the work of Piketty (2014) which suggests the possibility that inequality is destined to increase indefinitely over time since the rate of return of capital might exceed the growth rate of the economy. Although there is an ongoing debate about whether inequality is indeed an inevitable consequence of contemporary capitalism, the fact that inequality has risen in several rich economies over the last four decades has re-ignited the need to better understand the dynamics of income and wealth and how these might affect development over time (Bourguignon, 2012; Galbraith, 2012; Piketty, 2015; Stiglitz, 2015).

The old question on whether inequality affects development has been examined in a variety of theoretical models reaching so far quite mixed predictions. For instance, some models highlight the possibility that inequality could be positive for economic growth as it might provide incentives to work harder, undertake risks and take advantage of profitable investments such as high returns to human capital (Mirrlees, 1971; Lazear and Rosen, 1981). Wealth concentrated among a few might also encourage capital accumulation if they have a higher propensity to invest instead of consume (Kaldor, 1956). A contrasting view in the theoretical literature comes from those models that consider the presence of credit market imperfections, such as asymmetries of information between lenders and borrowers. If these credit market imperfections prevent the poorest groups from undertaking profitable investments in physical or human capital for instance, then the differences in returns could be transmitted to future generations (Banerjee and Newman, 1993; Galor and Zeira, 1993). The extent to which inequality then affects development over time depends upon the relative balance between those who are credit and non-credit constrained (Ghatak and Jiang, 2002). Inequality may not necessarily deter growth if for instance there is a sizeable number of entrepreneurs that are able to pay high salaries to the relatively few poorer groups. However, growth will be hampered if there is an excessive level of inequality to start with in the sense of having very few entrepreneurs relative to the vast number of poor credit-constrained people with no other choice but to receive low wages.

Several empirical studies have attempted to assess the channels through which inequality might affect long-run development. In this respect, a few cross-country studies have found that under the presence of credit market imperfections, inequality is associated to lower levels of human capital accumulation that in turn reduces growth (Deininger and Squire, 1998). A few others have tried to assess the role of inequality within a political economy context. For instance, Perotti (1996) shows inequality is associated with lower rate of taxation which in turns reduces growth, contradicting then the predictions derived from the theoretical model by Alesina and Rodrick (1994). Due to a lack of unified theory as how inequality might affect growth, more recent empirical studies have diverted attention to testing whether inequality has an overall positive or negative effect on economic growth, ignoring the various mechanisms by which this might be the case (Galor, 2012). The evidence in this respect has been quite mixed. While a few panel and cross-section studies have found a positive effect of inequality on growth (Li and Zou, 1998; Deininger and Olinto, 2000; Forbes, 2000), various others have found a negative effect (Clarke, 1995; Banerjee and Duflo, 2003; Knowles, 2005; Ostry et al., 2014). A few other studies have found that inequality has a positive effect only on rich countries whilst a negative effect on poor countries (Barro, 2000; Castelló-Climent, 2010; Halter et al., 2014). The lack of consensus among this vast empirical literature is perhaps unsurprising given the likely endogenous relationship between growth and the commonly contemporaneous inequality measures used.

The contributions of this article are to test *whether* and *how* inequality in the distant past affects development in the long-run. To this end, unlike much of previous empirical efforts, the article uses historical indicators of inequality across 57 countries and tests whether past inequality is associated to the industrial activity that these countries experienced centuries after. This preliminary exploration shows that historical inequality in the early 1800s is negatively associated to the growth that industries experienced over the period 1985–2010 in terms of number of firms created, their size, output, value added and profit margin. These cross-country correlations, although interesting, are insufficient to conclude that inequality has a causal effect on development, particularly since both historical inequality and more contemporaneous industrial activity could be driven by omitted variables.

One way to increase our understanding on whether inequality is a factor influencing development is to empirically test *how* inequality might affect industrial activity over time. To this end, this article examines four of the main channels mentioned in the theoretical literature. The first two channels refer to how high levels of income inequality might affect the accumulation of human and physical capital over time. As mentioned earlier, if credit imperfections prevent the poorest groups from undertaking profitable investments, unlike wealthier groups, then these differences in wealth can affect over time workers' productivity, associated salaries, firms' overall output and value-added. As a result, high levels of historical inequality are likely to disproportionally affect those firms (or industries) more dependent on human and physical capital. For instance, ceteris paribus, an industry that is intensive in skilled human capital, such as transport equipment, is likely to grow in terms of number of employees at a relatively slower pace than those which require less skilled labour, such as the pottery industry, in countries that a priori had higher levels of inequality. Similarly, the other two channels explored refer to the degree of industries' dependence on external finance and written contracts. In this sense, the literature has suggested that credit market imperfections and inability to enforce contracts are more likely to deter investments and growth in highly unequal countries, and particularly more in those these industries more dependent on external finance and written contracts (Banerjee and Newman, 1993; Nunn, 2007; Blaum, 2013).

To test the four channels as *how* inequality might affect growth, I follow closely the method first proposed by Rajan and Zingales (1998). These authors examined whether industries that are relatively more in need of external finance grow relatively faster in countries that were a priori more financially developed. Using then a within-country-between-industry regression approach, they looked at the interaction between countries' financial development and industries' degree of dependence on external finance, providing a stronger test of causality than simple correlations. Unfortunately, there is no information of the extent of various industries' financial dependence across countries. Thus, another contribution of Rajan and Zingales was to identify the degree of external finance dependence for large industries in the USA (understood as the difference between investments and cash generated from operations) which they argued serve as a good benchmark proxy for the dependency that the same industries have in other countries. This assumption relies on two main arguments. Firstly, due to technological reasons, some industries depend more heavily on external finance than others. This could be due to differences in up-front fixed costs, gestational periods of production and when firms can expect to receive cash flows. Secondly, these technological differences are likely to persist across other countries; hence, the level of industry's dependency in USA is likely to be a good measure of dependency in other countries. Although local conditions varies across countries, Rajan and Zingales argue the relative ranking of external dependence across industries is likely to remain fairly similar in other countries as these different needs on external finance steam from technological reasons.[1] In the same spirit here, this article tests how inequality affects growth by looking at

[1] For instance, pharmaceuticals require larger up-front investments and higher gestational period before receiving cash than that in the textile sector in the USA, and these differences in external dependency are argued to prevail in other countries as well.

the interactions between countries' historical inequality levels and industries' dependence on external finance, written contracts, human and physical capital.

Following the literature, I use the industries' dependence on external finance as estimated by Rajan and Zingales (1998), on written contracts measured by Nunn (2007), on human capital by Ciconne and Papaioannou (2009) and on physical capital estimated by Bartelsman and Gray (2006). All these industry dependences have been estimated for USA industries and commonly used in the literature as a benchmark of the characteristics of same industries in other countries (Beck and Levine, 2002; Feijen, 2005; Blaum, 2013). Whilst this benchmark characteristics approach has proven fruitful in the literature, it does not yield the same causal inferences that can be derived only from experimental approaches. Nonetheless, this approach helps showing how inequality affects growth whilst avoiding having endogeneity and multicollinearity issues common in simple cross-country analysis. To guard against omitted variable bias, following the benchmark industry literature, I also control for other determinants of industrial activity, such as levels of development, country- and year-fixed effects.

To test whether and how historical inequality affects industry activity, I use data for the 28 large manufacturing industries available in the Industrial Statistics of the United Nations Industrial Development Organization (UNIDO). This dataset, commonly used in the benchmark industrial literature, provides information about large industries' growth in terms of number of firms, output, value-added, salaries and profits across countries for each year during the period 1985 to 2010.[2] The analysis focuses exclusively for the 57 countries for which there are historical estimators of income distribution from the 19th century until the 20th century. These estimators are taken from Bourguignon and Morrisson (2002), who were the first to provide a broad view on the levels of global inequality and provided income share by decile, which I use to test the impact of different measures of inequality indicators over time.

The article finds industries that are relatively more in need of external finance and contracts experienced a lower rate of firm creation in countries with higher historical inequality levels. Similarly, industries more intensive in skilled labour and physical capital experienced lower rates of growth in firms' size (in terms of number of employees), output and real value in more unequal countries. These findings substantiate how inequality deters investment in human and physical capital and the mechanisms involved in affecting long-run

[2] Access to the UNIDO data set was obtained via UKDS.STAT website.

growth. These mechanisms show how inequality affects developments that are robust to using different measures of inequality, ranging from the traditional Gini coefficient to different ratios of wealthy to poor, which are taken as proxies of the differences in wealth between those who are credit and non-credit constrained.

Albeit there has been a decline in inequality levels if comparing the levels prevailing in 1800s and 1980s, the overall ranking in terms of which countries are more unequal than others has remained relatively stable over time. This might explain why the results presented are also fairly robust when estimating the impact of inequality at different points in time, dating back to 1800s and more recently up to 1980. The detrimental effects of inequality on industry's activity are also robust if using data for industrial activity across different periods, such as excluding the recent global recession.

The rest of the article is organised as follows. Section 2 discusses the literature on how inequality might affect development. Section 3 presents the historical data on inequality and activity by industrial sector. Section 4 tests four mechanisms as how inequality might affect industries growth. Section 5 presents the robustness checks. Section 6 concludes.

2. How inequality in the distant past affects development?

This section discusses four of the most salient channels as how inequality may affect long-run growth and more specifically industries' activity.

Physical capital

Several theoretical models studying physical capital accumulation concur that income inequality could be detrimental for long-run development. Notably, Banerjee and Newman (1993) analyse the effect of inequality considering an occupational choice model where people can become workers or entrepreneurs. Since entrepreneurship requires covering up-front a fixed-cost, this occupation is available only to those who can self-fund it or complement their wealth with borrowing. Due to credit market imperfections, borrowing is available only to those wealthy enough to provide collateral. In this model, then the returns to occupations depend on the initial wealth distribution, which thereby determines the bequests left to offspring, investments and occupational choices of future generations. The extent to which initial inequality is actually harmful to development is dependent on the balance between the credit and non-credit constrained. Overall, if the economy starts with a high ratio of very poor people to very rich people, then the country will converge to a situation of low employment, low wages and low output. By contrast, if the country has few very poor people, it can converge to a high-wage, high employment steady state provided that there is a sufficient number of people non-credit constrained that can establish their own businesses.

The empirical literature on whether credit market imperfections and inequality affect entrepreneurship remains quite mixed. Some have found that liquidity constrains deter self-employment for poorer households (Gentry and Hubbard, 2004; Zissimopolos et al., 2009), while others find no evidence of a necessary binding liquidity constraint (Hurst and Lusardi, 2004). As Frid et al. (2016) argue, this mixed evidence might be because much of empirical studies have not considered the initial wealth of the household prior to becoming entrepreneurs, or studies often focus on only people that have businesses already established omitting assessing start-ups. To overcome these limitations, Fried et al. (2016) use the Panel Study of Entrepreneurial Dynamics II from nascent entrepreneurs in USA. They find that initial wealth of the entrepreneur does not constrain start-ups, but it is an important determinant of entrepreneurial success. Studies more specifically addressing developing countries suggest that despite start-up costs for small businesses being significantly low, there is still evidence to support the negative impact of liquidity constraints (Naudé, 2010). For instance, Mesnard and Ravallion (2001) find inequality reduces the rate of business creation. The evidence on this later point is nonetheless inconclusive as other studies have found a positive association between moderate levels of inequality and entrepreneurship, thus suggesting that inequality might also encourage business participation, particularly in developing countries (Rapoport, 2002; Naudé, 2008).

Human Capital

The view that inequality can be detrimental under the presence of credit market constrains is also shared by several theoretical models analysing human capital accumulation (Galor, 2012; Murphy and Topel, 2016). Normally, in most types of investments, people can acquire goods that become their own collateral, such as when buying a house that the mortgage provider can seize in case of no repayment. However, due the nature of investments in human capital, these cannot become their own collateral. Moreover, lenders face the challenge of seizing borrowers' future income flow given the uncertainty about its level and regularity (Fafchamps, 2013). Borrowers can also shrink or flee to avoid repayment and trying to prevent these instances on court systems is unlikely to be fully effective. As Becker (1962) described, courts frown on contracts which imply involuntary servitude to pay even indirectly. As a result of these credit market imperfections, much of the investments in human capital are largely based on families' own wealth. The seminal theoretical model of Galor and

Zeira (1993) formalizes this conclusion by showing that under the presence of credit market imperfections and fixed costs associated with investments in education, inequality results in under-investments in human capital. Since human capital is one of the key determinants of workers' productivity, inequality in turn adversely affects economic growth in both the short- and long-run. The effects of inequality are long-lasting given that the differentials in productivity, reflected in low salaries for poor families, whilst higher income flow for wealthier families, are passed over generations leading to under-investments in human capital over time (Galor and Zeira, 1993).[3] Consistent with this prediction, Perotti (1996) shows inequality is associated with lower level of human capital formation and lower levels of economic growth. Similarly, Easterly (2007) use agricultural endowments as an instrument for inequality finding inequality acts as a barrier to accumulating human capital and in turn affects growth, which is a conclusion shared by other recent studies (Papageorgiou and Abdul-Razak, 2009).

One could argue that parent's wealth nor inequality need to be a detrimental factor for human capital investment considering that the provision of public schooling could offset the effect of credit market imperfections. On this point, however, the segregation literature has shown that the effect of inequality on investment in human capital can remain strong given that parents affect the probability of their children's income through the choice of a neighbourhood in which they live, thereby the type of public education available (Durlauf, 1996). As such, one can find segregation effects across communities resulting in persistent differentials in education and income (Benabou, 1996; Fernández and Rogerson, 1996). An additional strand of literature has analysed the relationship between income inequality and equality of opportunities finding that family income is not a sufficient condition to determine whether poverty persists across generations. However, inequality has been found to affect the

[3] Morrisson and Murtin (2013) have estimated the world distribution of years of schooling. They show that Western Europe is the only region in the world where differences in returns to education within countries, to what they call human capital inequality, has been continuously falling since 1870. In all other regions, human capital inequality increased sharply at least until the mid-20th century. These differences are perhaps due to the fact that in relative terms, Western Europe had the lowest income inequality in the distant past, 1800s, compared to other regions, as well as the early role of investing in public education.

degree of intergenerational mobility, the efficiency in allocation of talents and the persistent income inequality transmission across generations (Corcoran et al., 1989; Durlauf, 1996; Owen and Weil, 1998; Checchi et al., 1999; Hassler et al., 2007).

Several studies in the literature have more specifically analysed the mechanisms as how human capital affects economic growth. For instance, it has been argued that high level of human capital facilitates adopting new technology, particularly intensive in skilled-labour, thereby increasing worker's productivity and growth (Nelson and Phelps, 1966; Caselli and Coleman, 2006). Similarly, Ciconne and Papaioannou (2009) using the benchmark industry method proposed by Rajan and Zingales (1998) show that the value added and employment growth in industries intensive in human capital grows faster in economies with high initial levels of human capital. These authors however do not analyse the interplay between inequality and human capital. Given that inequality of opportunities to invest in human capital is transmitted across generations, countries that a priori have high levels of inequality are likely to have larger differentials in human capital over time, thereby likely to affect disproportionally the growth prospects of industries typically intensive in human capital.

Financial dependence

Much focus has been placed on the extent to which financial development could mediate the likely negative effects of inequality on development (Kanbur, 2000; Demirguc-Kunt and Levine, 2009).[4] One view is that financial development reduces the negative effects of inequality by allowing the poor and disadvantaged groups to take up new business opportunities thereby reducing intergenerational inequality (Becker and Tomes, 1986). Albeit financial developments might also help wealthier groups and those with already access to finance, those poor and low-skilled workers could also benefit if there is an increase in their labour (Townsend and Ueda, 2006). Thus, financial development can improve the efficiency of resource allocation, boost wages and increase economic growth (Demirguc-Kunt and Levine, 2009). This view is however challenged by those studies that instead suggest inequality could have long-term detrimental effects if wealthier groups benefit disproportionally from financial development. This could be the case if the wealthy groups are predominantly the ones seizing investments opportunities in education (Jacoby and Skoufias, 1997; Baland and Robinson, 1998) undertaking the most profitable business

[4] By finance, it is understood as the ability of financial markets to realize people's investments opportunities and manage risks.

projects (Evans and Jovanovic, 1989; Greenwood and Jovanovic, 1990; Holtz-Eakin et al., 1994), more able to diversify risks, smooth adverse income shocks (Stiglitz, 1974; Eswaran and Kotwal, 1985), and save and pass more bequests to their children (Demirguc-Kunt and Levine, 2009).

Although the theoretical predictions are mixed, the empirical evidence is more consistent in showing that improvements in financial services are positive for development. For instance, cross-country studies have found financial development promotes growth, increases competition and boosts demand for labour, thereby benefiting the poor (Demirguc-Kunt and Levine, 2009). One concern with these studies however is to ascertain whether financial development causes growth, or the other way around (Goldsmith, 1969), and whether the association found is indeed a causal-effect one (King and Levine, 1993). To address this causality concern and avoid issues with multicollinearity and omitted variables common in cross-country studies, Rajan and Zingales (1998) proposed a new method aimed at isolating the impact of financial development on growth. This method uses a cross-country regression fixed effects approach to test whether industries that are relatively more in need of external finance grow faster in countries with more-developed financial markets. These authors then by exploiting the variance across 41 countries' financial development and 36 industries' dependence on external finance conclude financial development fosters industries' growth.

Several other studies have since adopted Rajan and Zingales's benchmark industry method showing that financial development has a positive effect on entry and growth rates (Klapper et al., 2006) and on allowing firms' expansion, particularly among smaller firms (Beck et al., 2008). Similarly, Blaum (2013) uses income inequality indicators for the 1980s (as a proxy for the ratio of credit to non-credit constrained people) and data on manufacturing industries across 39 countries to show that industries that relied more heavily on external finance were smaller (in terms of value added and output) in countries with higher levels of income inequality. Blaum rationalises these findings by providing a theoretical model where inequality dampens the positive effect of financial development on entrepreneurship. Specifically, in his model, people can choose whether to work for a wage or start a firm in either of two sectors, which one depends more heavily on external finance than the other. Due to collateral constraints, poor people have no other choice but to become workers, those with "middle income" to sort into the sector with lower financial needs, and the wealthy to sort into the sector with higher financial needs. Thus, in highly unequal countries, the number of people that are able to meet the collateral requirements and enter the more externally dependent sector is greatly reduced.

Enforceability of contracts

The ability of a country to enforce written contracts is another factor that could lessen the detrimental effect that inequality might have on long-run development (La Porta et al., 1997; Acemoglu et al., 2001; Levchenko, 2007). Well enforced contracts allow people to overcome disagreements and frictions that might arise due to competing interest, thereby providing people more incentives to seize investment opportunities, diversify risks, and establish cross-dynasty transfers (Stiglitz, 1974; Demirguc-Kunt and Levine, 2009). Thus, by reducing contract imperfections, countries can also reduce labour and capital market distortions and increase international trade (Williamson, 1979; Nunn, 2007; Manova 2012). For instance, Nunn (2007) using the within-country-between-industry approach proposed by Rajan and Zingales finds countries with better contract enforcement export more in those industries that rely more on relationship-specific investment used as a proxy for being more dependent on good contract enforcement.[5] This association is so strong that suggests countries' ability to enforce contracts explains more trade patterns than physical capital or skilled labour endowments combined. Similarly, Claessens and Laeven (2003), following Rajan and Zingales' method, find intangible-intensive industries grow faster in countries with more secure property rights, thus providing indirect evidence that property rights affect firms' assets choice and influence the efficiency of resource allocation. Interestingly, improvements in property rights have the same large effect as improving access to financing. In a related study, Caselli (2011) shows industries with high dependence on external finance that are located in countries that had higher levels of inequality during the 1960s growth significantly slower following trade liberalisation policies. Thus, highly unequal conditions seem to increase the need for financial contracts to be well enforced to ensure repayment and ease risk diversification.

In sum, albeit previous studies have empirically tested some of the mechanisms as how inequality might affect long-term growth, these efforts have focused on just one or two mechanisms ignoring other important ones at play. To increase our understanding as how

[5] These specific investments were measured using two proxies for USA firms: the proportion of the good's intermediate inputs that require relationship investments and by classifying inputs that are neither bought nor sold on an exchange nor reference priced.

inequality affects growth, I use the industry benchmark method proposed by Rajan and Zingales in the next section. I do so to specifically test whether industries that are relatively more intensive in external finance, written contracts, physical and human capital are disproportionally affected in countries that were a priory more unequal.

3. Data

3.1 Historical income distribution at country level (1820–1980)

I use the estimates of the income distribution across the world over the last two centuries by Bourguignon and Morrisson (2002).[6] These estimates in addition to covering an extensive period have the advantage of providing the income share for each decile per country which are used to build different measures of inequality including the traditional Gini coefficient for 1820, 1910 and 1980. I use these inequality measures as proxies for the differences in wealth that prevailed in the distant past between the credit and the non-credit constrained. I do so as previous evidence suggests people in the poorest deciles are less likely to have access to credit than people in the top deciles due to differences in collateral, feasibility of planned ventures, credit history and proximity to banks (Baliamoune-Lutz et al., 2011; Berg, 2013).

As Table 1 shows, there were some reductions in inequality levels across countries since 1820. Nonetheless, in relative terms, countries that were highly unequal, or relatively egalitarian, in 1820 remained so in 1980. The same pattern is found when using the Gini coefficient and other measures of inequality. For instance, Figure A.1 in the Appendix shows the Gini coefficient for each of the countries analysed for the years 1820 and 1980. Similarly, Figure A.2 in the Appendix shows a different proxy of inequality: the income share of the top four deciles to the income share of the bottom four deciles. Both figures show that Asian countries, such as Japan, Korea and China, which started with low levels of inequality in 1820, remained with low levels of inequality in 1980. In contrast, South Africa and countries

[6] These estimations rely mostly on historical estimators of real GDP and population size by Maddison (1995) and other similar sources. In total, Bourguignon and Morrisson (2002) estimated the income distribution for 33 countries or groups of countries. Those whose weight in the world is significant was considered individually, whereas others such as Sub-Saharan Africa and Latin America were estimated at sub-group level according to their similarity in economic evolution and homogeneity.

in the Latin American region remained among the most unequal over time. Thus, inequality levels have a strong inertia, albeit there are very few exceptions to this pattern. For instance, the United Kingdom had similar levels of Gini coefficient as Mexico in 1820, but had much lower levels by 1980.

3.2 Country-Industry 1985–2010

To assess the long-run impact of inequality on growth I use the Industrial Statistics of the United Nations Industrial Development Organization (UNIDO) dataset, commonly used by the literature using Rajan and Zingales industrial benchmark method. The UNIDO INDSTAT4 database (revision 3) includes statistics for manufacturing industries at the three-digit International Standard Classification (ISIC) level on an annual basis from 1985 until 2010.

Using the UNIDO dataset, I estimate for each industry and country the number of firms, average number of employees per firm, firms' real output, real value added and the Lerner's index also known as price-cost margin. I obtain all these statistics for the 57 countries for which there are also historical indicators of income distribution. The variable definitions, list of the countries analysed and descriptive statistics of the industries analysed are presented in the Appendix (Tables A.1 and A.2). The industry-level Lerner index is estimated for each industry *i* in country *c* in each year, *t*, as shown in equation (1).

$$Lerner\ index_{i,c,t} = \frac{Valueadded_{i,c,t} - Wages_{i,c,t}}{Output_{i,c,t}} \qquad \text{eq.(1)}$$

Table 1 shows that the average annual growth in the number of manufacturing firms over 1985–2010 was 2.3%, but with wide differences across regions. Over that period, Latin America, the most unequal region in the world, had an annual growth in number of manufacturing firms of -2.2%. Other less developed regions, yet more egalitarian, had a much higher rate in firm's growth such as Africa (2.7%) and Asia (6.3%). Latin America also had a worse growth rate in both real output and real value than Africa and Asia over the period 1985–2010.

I move on to assess whether there is any correlation between income distribution in the distant past and industries' growth. For instance, Figure 1 Panel A plots the average rate of growth in the number of manufacturing firms' over the 1985–2010 period against the Gini coefficient in 1820 across the 57 countries analysed. It shows a negative and statistically significant relationship. In other words, countries that were more unequal in the distant past had their number of firms grow at a lower rate over time than those countries that had lower levels of inequality in the distant past. This negative relationship is robust to different measures of inequality in 1820 and more recent data on inequality such as that prevailing in 1910 and 1980. For instance, Figure 1 Panel B plots the same average rate of growth in number of firms against the ratio of the income share of the top four deciles to the income share of the bottom deciles in 1820. The plot once again shows a negative relationship including the few cases such as the UK that managed to reduce their inequality levels later on. The same negative association is found between inequality and the number of employees per firm, real output, real value and the Lerner index as shown in Table A.2 in appendix. As mentioned earlier, these associations should be analysed carefully as do not allow us to discern any causal relationship between inequality and growth nor the mechanisms at play.

4. The basic test: Mechanisms at play

To progress in our understanding as how exactly inequality affects industries' growth, I simultaneously test four of the main channels through which inequality could affect development, as according to the literature reviewed. To do so, I estimate the panel fixed effects regression shown in equation (2). The specification uses industry, country, time effects as well controls for initial differences in industry size. More importantly, following Rajan and Zingales's method, only additional explanatory variables that vary both by industry and country are added. Thus, to show how the mechanism through which inequality might have affected industries, I include the interaction between different indicators of historical inequality and the degree of industries' intensity in human capital, physical capital, dependence on external finance and contracts. By looking at these interaction effects between country and industry indicators rather than direct effects, the number of variables used is reduced as well as the range of possible alternative explanations (Rajan and Zingales, 1998, 584).

$$ln\ Y_{i,c,t}=\alpha+\delta_i+\lambda_c+\eta_t+\gamma ln Y_{i,c,1985}+\beta_1(\text{Inequality}_{\text{pastc}}\text{*Education}_{ic})+\beta_2(\text{Inequality}_{\text{pastc}}\text{*Capital}_{ic})$$
$$\beta_3(\text{Inequality}_{\text{pastc}}\text{*External Finance}_{ic})+\beta_4(\text{Inequality}_{\text{pastc}}\text{*Contracts}_{ic})+\varepsilon_{ict} \quad \text{eq. (2)}$$

I examine separately five dependent variables all measured in natural logarithm: the number of firms, number of employees per firm, real output, real value and the Lerner index. Each of these dependent variables are denoted by $Y_{i,c,t}$ in industry *i* in country *c* in each year, *t*, from 1985 until 2010. δ_i and λ_c are the industry and country fixed effects that account for differences in the dependent variable due to economic, political, or institutional variance among industries and countries. Similarly, η_t represents a dummy variable for each year to control for time-trending variables such as changes in economic growth that could be correlated with the dependent variable. To account for initial differences in the size of industries, following the literature, I also add $\gamma ln Y_{i,c,1985}$, which is the initial value of the dependent variable at the beginning of the period analysed and measured in natural logarithm. The β coefficients are those of interest as they capture the impact of the interactions between the historical inequality indicators ($\text{Inequality}_{\text{past}}$) for each country and the industry intensity in secondary education, physical capital, external finance and contracts. ε_{ict} denotes the random error term. All specifications have heteroscedasticity robust standard errors clustered at country level. Note that as it is common in the benchmark industry literature, I analyse multiple observations per country, examining situations where the direction of causality is least likely to be reversed. In the sensitivity section however, different periods in time are analysed showing consistency in findings.

The industries' intensities used have been estimated by several studies for the manufacturing sectors in the USA and are regarded as a good benchmark representation of the type of production functions and dependency of manufacturing sectors in other countries. Specifically, I use two proxies of industrial intensity in human capital, both estimated by Ciccone and Papaioannou (2009). The first one refers broadly to the worker's average number of years of schooling at the industry level in 1980. As a sensitivity check for this proxy, I also use the intensity in secondary schooling, measured as the ratio of hours worked by employees with at least sixteen years of education to total hours worked in each industry. In terms of intensity of investment in physical capital, I use the proxies estimated by Bartelsman and Gray (1996) who define it as the total real capital stock over total value added in 1980 for USA firms. For external finance dependence, I use the benchmark estimated by Rajan and Zingales (1998) who measured it as the industry median of the ratio of capital expenditure minus cash flow to capital expenditure for USA firms over 1980–1989. For contract intensity, I use the proxy estimated by Nunn (2007), who identified the intermediate inputs used, and in which proportion, in the production of each final good in manufacturing. Table A.3 in the Appendix presents the industries' intensities just described for the 28 manufacturing sectors available and details how these were constructed and the sources used.

4.1 Results

Table 2 shows the interactions between the industries' intensities and the historical inequality measures as shown in equation (2). To start with, I use the ratio of wealthy people (income share of top four deciles) to poor people (income share of bottom four deciles) prevailing in 1820. In the next section, I present a sensitivity analysis for these interactions using different inequality measures. However, as a baseline, I prefer to use this 40/40 ratio as it more closely resembles the differences in income between those who were credit and non-credit constrained than other typical measures of inequality such as the Gini coefficient which instead assess overall differences in income across the population.

As is standard in this literature, for all regressions presented, I exclude the USA from the analysis as it is the country being used as industry benchmark (Rajan and Zingales, 1998). Similarly, following the literature, I exclude countries that have less than 10 industries and less than five years of data for each country-industry (Ciconne and Papaioannou, 2009).

Human capital. As shown in columns (3) and (4), the interaction between industries' intensity in human capital and inequality is negative and statistically significant for the number of employees per firm. In other words, industries that are relatively more intense in skilled labour grew in size at slower rates in more unequal countries. This negative relationship is found for both proxies of intensity in human capital used: worker's average number of years in industry and intensity in workers with education of secondary level.

One way to get a sense of the magnitude of the interaction effects is to compare how much lower the growth rate of the number of employees per firm of an industry at the 75th percentile of secondary school intensity would be compared to an industry at the 25th percentile level when the industries are located in a country at the 75th percentile of historical income inequality rather than in a country at the 25th percentile. For instance, the industry at the 75th percentile, transport equipment, has a secondary school intensity ratio of 0.78. The industry at the 25th percentile, pottery, has an intensity of 0.65. Bulgaria, which is the country at the 75th percentile of inequality, has a value of 6.82 for the inequality ratio index, and Korea, at the 25th percentile, has a value of 4.43. The estimated coefficient for the interaction term in column (2) equals -0.36 and we can set the industry's initial share of manufacturing at its overall mean. Thus, the interaction coefficient estimates predict the difference in growth rates between the 75th and 25th percentile of secondary school intensity interaction industry to be -11.18% per year lower in a country with inequality index of 6.82 compared to one of 4.43. In terms of economic interpretation, previous literature has suggested that high levels of inequality prevent people from acquiring human capital over time. Thus, as the findings presented show, inequality seems to harm industries chances of finding qualified personnel, particularly those intensive in skilled labour, thus affecting growth prospects.

Table 2 also shows there is a positive and statistically significant interaction coefficient between inequality and human capital when analysing the number of firms as a dependent variable (columns 1 and 2) and when using the Lerner index proxy for price-cost margin as a dependent variable (columns 9 and 10). What can explain these positive associations? One possibility is that as the literature predicts, in highly unequal countries, people are prevented from acquiring human capital and these countries might end up with abundant cheap unskilled labour as a result, which will not be necessarily harmful for industries' growth. For instance, firms could find a more generous price-cost margin and therefore there could be more incentives for other firms to enter the market.

Physical capital. The interaction between the historical inequality measure and intensity in physical capital is negative and statistically significant for firms' real output, real value and number of employees. To assess the magnitude of this interaction, it is possible to infer how much lower the growth rate of the number of employees per firm of an industry at the 75th percentile of physical intensity would be compared to an industry at the 25th percentile level, when the industries are located in a country at the 75th percentile of historical income inequality, rather than in a country at the 25th percentile. The industry at the 75th percentile, glass and related products, has a physical capital intensity ratio of 1.954. The industry at the 25th percentile, furniture, has an intensity of 0.79. The regression coefficient estimates therefore predict the difference in growth rates between the 75th and 25th percentile of physical capital intensity industry to be -8.35% per year lower in a country with inequality index of 6.82 compared to one of 4.43. Although this interaction is negative for the number of firms, it is not statistically significant. All these results seem to support the predictions of Banerjee and Newman (1993). These authors argue that if a large proportion of people are credit constrained, they could still engage in small-scale business, thus not necessarily affecting the number of firms. However, if they are credit constrained, these businesses will remain small and have reduced output over time.

External financial dependence. The interaction between the inequality proxy and intensity in external finance is negative and statistically significant for the number of firms, real output, real value and the Lerner index. To illustrate the magnitude of this interaction, the industry at the 75th percentile of dependence on external finance should grow 8.22 percent faster in terms of number of firms created than the industry at the 25th percentile in a country at the 75th percentile of inequality (Bulgaria) as compared to one at the bottom 25th percentile (Korea). These findings are consistent with the predictions of previous literature. If a substantial share of people is unable to access credit in highly unequal countries, inequality then hinders the growth of those industries intensive in external finance (Blaum, 2013).

Contract intensity. The interaction between the inequality proxy and intensity in contracts is negative and statistically significant for the number of firms, real output and real value. These findings also support the predictions of the literature which suggest weakness in enforcing contracts discourages investments, thereby output and real value. These results might also support de Soto’s argument that countries with high levels of red-tape essentially increase the cost of doing business. These effects are potentially even more harming in highly unequal countries given the uneven access to credit markets, which hinders the growth in number of firms, the output and real value that firms can produce. The interaction is not statistically significant for firms’ size, perhaps because contract intensity might affect firm creation and output rather than number of employees that can be hired.

5. Sensitivity analysis

5.1 Different measures of inequality

I re-examine the interactions between inequality and the industries intensities by using different inequality measures. For instance, Table 3 presents the results of re-running the results presented earlier (in Table 2), but using instead the Gini coefficient for 1820. The interactions between the Gini coefficient and industries’ intensity remain similar to those presented earlier, in terms of sign and significance. The only difference is that the interaction between the intensity in human capital and the level of inequality against the numbers of firms is no longer positive.

As a second robustness check, I also examine whether inequality continues to have a detrimental effect on industries when more recent measures of inequality are used. Table A.4 in appendix uses the same measure of inequality, the income ratio of the top four to bottom four deciles, but in year 1910 instead of 1820. I found the same pattern described earlier in terms of sign and significance level. Nonetheless, the magnitude of some interaction effects is slightly higher, such as the interaction in external finance and contract intensity. Similarly, Table A.5 uses the inequality measure for 1980, which is much closer to the beginning of the period of the analysis. Once again, overall, the interaction effects follow the same pattern in terms of sign and statistical significance. However, the magnitude of some of the coefficients is slightly higher compared to those of 1820 and 1910. Overall, these results support recent studies that estimate the impact of recent inequality indicators of economic growth. For instance, Dabla-Norris et al. (2015) suggest that a higher income share for the top 20% richest reduces economic growth, and Cingano (2014) finds that the gap between low income households and the rest of the population harms growth.

5.2 Sensitivity analysis using different periods for manufacturing industry

A concern with the results presented so far is the inclusion of the latest global recession that hindered manufacturing activity. To assess whether the results presented thus far change if this period is excluded, Table 4 presents the regression results using manufacturing data from 1985–2007 and the ratio 40/40 presented previously as proxy for historical inequality. The results have a similar sign and statistical significance to the baseline results presented in the previous section.

6. Conclusion

This article has provided evidence on *whether* and *how* inequality in the distant past affects long-run growth. To this end, the article used the historical income inequality estimates of Bourguignon and Morrisson (2002) going as far as back as the 1800s until recent years. This article also simultaneously explored four of the main channels through which the literature argues that inequality could affect industrial activity. Following Rajan and Zingales (1998), the identification strategy relied on exploiting the differences across 28 industries dependence on external finance, contracts, human and physical capital. These intensities were then interacted with the historical levels of inequality across 57 countries. The intuition behind this approach is that if inequality prevents a fraction of the population from taking up profitable investments, the sectors most affected are those where people have been more constrained to invest, either in terms of physical or human capital, as well as where there are stronger frictions that deter these investments, whether it is external financial dependence, or the ability of a country to enforce written contracts.

The article found that countries that had high levels of income inequality in the early 1800s have experienced lower creation of firms, particularly in industries that are intensive in external finance and contracts. Also, inequality is detrimental to firms' size, output and real value the more intensive industries are in skilled labour and physical capital. The overall evidence then supports the theories that argue that the initial wealth distribution influences the development path, particularly when credit market imperfections prevent people from accumulating human and physical capital over time.

Across several countries, there is growing evidence that the richer income groups have accumulated wealth overtime, but there is not much evidence that the poor have necessarily benefited (Stiglitz, 2015; Summers and Balls, 2015). In fact, the gradual rise of the wealth-income ratios in recent decades means that several advanced countries are returning to the high inequality levels they had during the eighteenth and nineteenth centuries (Piketty and Zuckman, 2014). The detrimental impact of inequality on industrial activity described in this article is likely to have contributed to a revival of inequality seen in recent years. Moreover, this recent increase in inequality is likely to have a long-term detrimental effect on development if no significant redistributive measures are taken.

The empirical evidence presented in this article is relevant for policy recommendations. Improving a country's ability to enforce contracts could have an important impact in terms of creating firms and jobs. Similarly, reducing inequality and improving access to financial markets could be beneficial for business activities. The majority of studies on international income mobility suggest that income is highly persistence across generations as the limited mobility observed occurs only over fairly small spans of the distribution (Burkhauser and Courch, 2009). Thus, major wealth distribution policy efforts are needed, particularly to benefit those at the bottom of the distribution.

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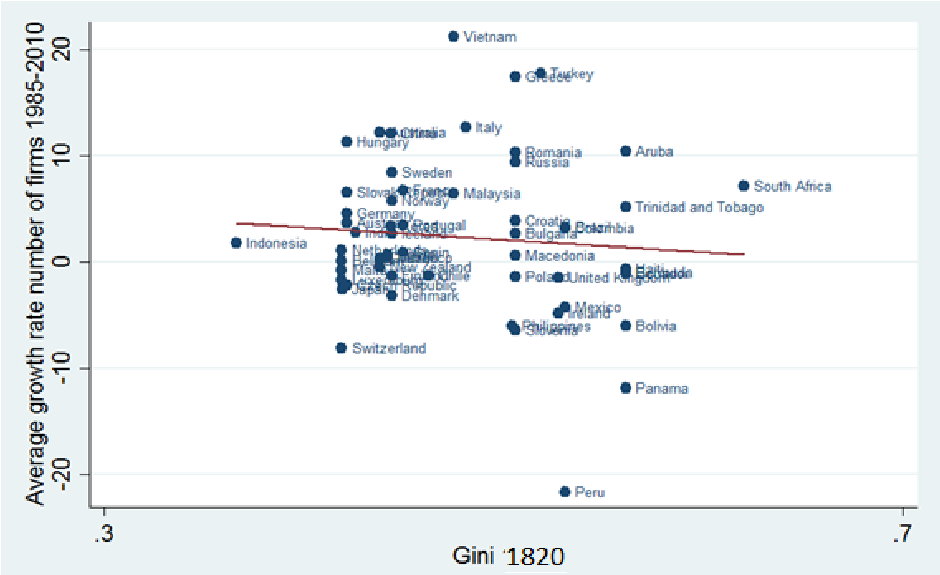
Tables and Figures

Table 1. Overall summary statistics

	All countries					Africa					Asia					Europe					Latin America				
	Countries	Mean	Std. Dev.	Min	Max	Countries	Mean	Std. Dev.	Min	Max	Countrie s	Mean	Std. Dev.	Min	Max	Countrie s	Mean	Std. Dev.	Min	Max	Countrie s	Mean	Std. Dev.	Min	Max
1820 ratio of accumulated income share top 4 deciles/bottom 4 deciles	56	5.9	1.7	3.5	12.0	3	7.2	4.2	4.7	12.0	9	5.1	1.2	3.5	6.9	29	5.30	1.12	4.40	6.82	12	7.7	0.8	5.1	8.0
1910 ratio of accumulated income share top 4 deciles/bottom 4 deciles	56	6.2	1.4	4.2	12.0	3	7.2	4.2	4.7	12.0	9	5.2	1.0	4.2	6.9	29	5.86	0.81	4.55	7.70	12	7.7	0.8	5.1	8.0
1980 ratio of accumulated income share top 4 deciles/bottom 4 deciles	56	4.9	1.9	2.5	10.3	3	7.0	2.9	4.9	10.3	9	4.7	1.3	3.1	6.9	29	3.65	0.54	2.54	4.31	12	7.8	0.5	6.3	8.0
Gini 1820	56	0.5	0.1	0.4	0.6	3	0.5	0.1	0.4	0.6	9	0.5	0.0	0.4	0.5	29	0.46	0.04	0.42	0.53	12	0.5	0.0	0.5	0.6
Gini 1910	56	0.5	0.0	0.4	0.6	3	0.5	0.1	0.4	0.6	9	0.5	0.0	0.4	0.5	29	0.49	0.02	0.45	0.53	12	0.5	0.0	0.5	0.6
Gini 1980	56	0.4	0.1	0.3	0.6	3	0.5	0.1	0.5	0.6	9	0.4	0.1	0.3	0.5	29	0.36	0.04	0.28	0.40	12	0.6	0.0	0.5	0.6
Growth in number of manufacturing firms 1985-2010	56	2.3	7.3	-21.7	21.2	3	2.7	3.8	0.4	7.1	9	6.3	9.1	-6.1	21.2	29	2.78	5.92	-8.13	17.38	12	-2.2	8.4	-21.7	10.4
Number of manufacturing firms at beginning of period analysed	56	1827.0	2815.8	7.1	14722.0	3	536.3	371.5	280.7	962.4	9	3561.4	4843.7	163.4	14722.0	29	1901.53	2487.15	39.56	10963.81	12	831.5	1619.9	7.1	4599.6
Growth manufacturing firm's size 1985-2010	54	-3.36	8.77	-22.86	44.89	3	-2.3	5.6	-8.6	2.1	9	-2.4	4.5	-11.2	4.6	27	-6.80	5.04	-22.86	-1.66	12	3.8	14.2	-16.6	44.9
Manufacturing firms's size at beginning of period analysed	54	125.9	162.6	7.0	975.0	3	153.9	99.6	84.1	268.0	9	143.2	88.9	42.9	292.7	27	145.86	213.44	22.24	975.03	12	78.5	82.7	7.0	328.2
Growth in manufacturing firm's output 1985-2010	55	1.3	2.5	-7.1	10.4	3.0	2.6	1.5	0.9	3.6	9	2.6	3.4	-1.2	10.4	28	0.94	1.89	-1.89	5.97	12	1.4	3.2	-7.1	4.1
Manufacturing firm's output at beginning of period analysed in real 1984 USA dollars	55	2.1	1.9	-2.1	6.3	3.0	1.7	1.2	0.6	3.0	9	3.2	1.9	0.3	6.3	28	2.28	1.79	-1.49	5.71	12	0.8	2.0	-2.1	4.2
Growth in manufacturing firm's value added 1985-2010	53	0.8	6.8	-22.5	21.6	3	3.4	4.0	-1.1	5.9	8	5.8	8.4	-3.5	21.6	28	-0.49	6.50	-22.45	15.93	11	0.6	6.6	-12.9	7.2
Manufacturing firm's value added at beginning of period analysed in real 1984 USA dollars	53	19.8	50.9	0.2	350.2	3	5.0	5.6	1.5	11.4	8	53.3	120.4	0.8	350.2	28	16.81	26.49	0.20	118.02	11	7.5	14.2	0.2	49.0
Growth in manufacturing firm's Lerner index of price-cost margin 1985-2010	51	-0.9	2.0	-5.8	6.1	3	-0.5	4.0	-3.5	4.0	8	-1.8	2.3	-5.8	0.8	27	-0.90	1.19	-3.24	1.80	11	0.3	2.3	-2.3	6.1
Manufacturing firm's Lerner index at beginning of period analysed in real 1984 USA dollars	51	0.2	0.1	0.1	0.4	3	0.2	0.1	0.2	0.3	7	0.3	0.1	0.2	0.4	27	0.21	0.05	0.13	0.32	11	0.3	0.1	0.2	0.4

Panel A



Panel B

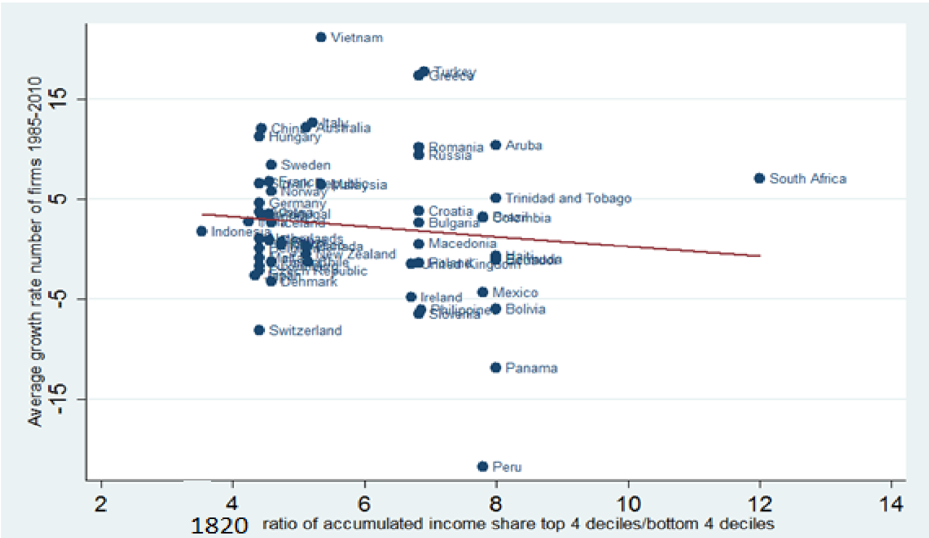


Fig. 1. Inequality in 1820 and average growth in number of firms 1985-2010

Table 2. Regressions interacting the inequality measure of year 1820 and the industries' intensity in schooling, physical capital, contracts and external finance over period 1985-2010

	Number of firms		Number of employees per		Real output		Real value		Lerner index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
School intensity interaction	0.02*		-0.04**		-0.00		0.01		0.01**	
[Ratio 4/4 deciles 1820 x hcint]	(0.01)		(0.02)		(0.01)		(0.01)		(0.01)	
Secondary school intensity interaction		0.18*		-0.36***		-0.05		0.06		0.11**
[Ratio 4/4 deciles 1820 x hcintsec]		(0.10)		(0.13)		(0.12)		(0.11)		(0.04)
Physical capital intensity interaction	-0.00	-0.01	-0.03**	-0.03	-0.03*	-0.02*	-0.03**	-0.03**	-0.00	-0.01
[Ratio 4/4 deciles 1820 x capint]	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
External finance interaction	-0.08***	-0.08***	-0.03	-0.03	-0.11***	-0.11***	-0.11***	-0.11***	-0.04***	-0.04***
[Ratio 4/4 deciles 1820 x extfin]	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)
Contract intensity interaction	-0.19**	-0.20**	0.07	0.08	-0.13**	-0.13**	-0.14***	-0.14***	-0.03	-0.03
[Ratio 4/4 deciles 1820 x contract]	(0.08)	(0.08)	(0.07)	(0.07)	(0.05)	(0.05)	(0.04)	(0.04)	(0.03)	(0.03)
Initial conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,498	18,498	17,168	17,168	18,394	18,394	17,746	17,746	16,196	16,196
R-squared	0.91	0.91	0.73	0.73	0.91	0.91	0.91	0.91	0.50	0.50

Robust standard errors clustered at country level are shown in parentheses. Significant at the *** p<0.01, ** p<0.05 and * p<0.1 levels.

The dependent variables across all columns are measured in natural logarithm at the country-industry level for the period 1985-2010. All models include the initial natural logarithm of the dependent variable for the first year of the period analysed. All specifications also include country, industry and year fixed effects (coefficients not reported). All the industry-level intensities used are for the three-digit ISIC (International Standard Industrial Classification) manufacturing industries in the United States in 1980, which was used as a benchmark.

Table 3. Regressions interacting the Gini coefficient of year 1700 and the industries' intensity in schooling, physical capital, contracts and external finance over period 1985-2010

	Number of firms		Number of employees per firm		Real output		Real value		Lerner index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
School intensity interaction	0.37		-0.96		-0.18		0.18		0.37*	
[1820 Gini x hcint]	(0.39)		(0.58)		(0.48)		(0.41)		(0.20)	
Secondary school intensity interaction		3.09		-8.45*		-1.77		0.88		2.68*
[1820 Gini x hcintsec]		(3.16)		(4.70)		(4.07)		(3.45)		(1.59)
Physical capital intensity interaction	0.02	-0.03	-1.01*	-0.85	-0.87**	-0.83*	-1.02***	-1.01**	-0.06	-0.09
[1820 Gini x capint]	(0.48)	(0.49)	(0.51)	(0.51)	(0.42)	(0.44)	(0.37)	(0.38)	(0.18)	(0.19)
External finance interaction	-1.81*	-1.83*	-1.06	-0.97	-3.20***	-3.16***	-3.02***	-2.95***	-0.96*	-0.91*
[1820 Gini x extfin]	(1.05)	(1.04)	(0.84)	(0.84)	(0.86)	(0.85)	(1.01)	(1.01)	(0.48)	(0.49)
Contract intensity interaction	-5.17**	-5.26**	1.71	1.95	-4.24**	-4.18**	-4.36***	-4.38***	-0.69	-0.77
[1820 Gini x contract]	(2.40)	(2.42)	(2.36)	(2.44)	(1.66)	(1.65)	(1.49)	(1.50)	(0.78)	(0.80)
Initial conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,498	18,498	17,168	17,168	18,394	18,394	17,746	17,746	16,196	16,196
R-squared	0.91	0.91	0.73	0.73	0.91	0.91	0.91	0.91	0.49	0.49

Robust standard errors clustered at country level are shown in parentheses. Significant at the *** p<0.01, ** p<0.05 and * p<0.1 levels.

The dependent variables across all columns are measured in natural logarithm at the country-industry level for the period 1985-2010. All models include the initial natural logarithm of the dependent variable for the first year of the period analysed. All specifications also include country, industry and year fixed effects (coefficients not reported). All the industry-level intensities used are for the three-digit ISIC (International Standard Industrial Classification) manufacturing industries in the United States in 1980, country used as a benchmark.

Table 4. Regressions interacting the inequality measure of year 1700 and the industries' intensity in schooling, physical capital, contracts and external finance over period 1985-2007

	Number of firms		Number of employees per		Real output		Real value		Lerner index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
School intensity interaction	0.02		-0.04**		-0.00		0.01		0.02***	
[Ratio 4/4 deciles 1820 x hcint]	(0.01)		(0.02)		(0.01)		(0.01)		(0.01)	
Secondary school intensity interaction		0.12		-0.38**		-0.04		0.08		0.12***
[Ratio 4/4 deciles 1820 x hcintsec]		(0.10)		(0.15)		(0.12)		(0.10)		(0.04)
Physical capital intensity interaction	-0.00	-0.00	-0.04*	-0.03	-0.03*	-0.03*	-0.03**	-0.03**	-0.01	-0.01
[Ratio 4/4 deciles 1820 x capint]	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
External finance interaction	-0.08**	-0.08**	-0.04	-0.03	-0.11***	-0.11***	-0.11***	-0.11***	-0.04***	-0.04***
[Ratio 4/4 deciles 1820 x extfin]	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)
Contract intensity interaction	-0.23***	-0.23***	0.08	0.09	-0.14**	-0.14**	-0.14***	-0.14***	-0.02	-0.03
[Ratio 4/4 deciles 1820 x contract]	(0.08)	(0.08)	(0.08)	(0.09)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)	(0.02)
Initial conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,856	15,856	14,640	14,640	15,844	15,844	15,248	15,248	14,002	14,002
R-squared	0.91	0.91	0.73	0.73	0.91	0.91	0.92	0.92	0.51	0.51

Ratio 4/4 decile 1700 is defined as the ratio of the income share of the top four deciles and the income share of the bottom 4 deciles for year 1700.

Robust standard errors clustered at country level are shown in parentheses. Significant at the *** p<0.01, ** p<0.05 and * p<0.1 levels.

The dependent variables across all columns are measured in natural logarithm at the country-industry level for the period 1985-2007. All models include the initial natural logarithm of the dependent variable for the first year of the period analysed. All specifications also include country, industry and year fixed effects (coefficients not reported). All the industry-level intensities used are for the three-digit ISIC (International Standard Industrial Classification) manufacturing industries in the United States in 1980, country used as a benchmark.