

Institutions and trade-related inequality

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Abstract

Trade liberalization is famously known for both creating winners and losers via processes of dislocation, sectoral reallocation, and specialization. This paper studies the conditions under which excess “losers” are generated during the process of liberalization with a focus on the role of institutions in economic transition. I contend that poor institutions, in particular property rights and democracy, can create unnecessary hardship in the transition to greater openness, generating a much higher burden on compensatory policies and making it more difficult to sustain open trade policies. Using a new dataset of trade openness, economic inequality, and institutions, and using 3SLS estimation to account for endogeneity, the analysis finds that this is indeed the case: high property rights and more democracy appear to help to mitigate trade-related inequality. Moreover, poor institutions create a downward spiral, with greater inequality leading to lower trade openness. These results imply that basic institutions can help to minimize losses sparked by globalization, while other well-meaning policies can actually increase disruptions.

KEYWORDS

democracy, globalization, inequality, institutions, property rights, trade

1 | INTRODUCTION

Trade as a percentage of GDP has increased substantially in both low- and high-income countries since 1990, leveling off somewhat after the global financial crisis but still approximately 2.5 times what it was in the early 1970s (Figure 1). Accompanying this increase in trade (but not necessarily driven by it, see Ravallion (2018)) has been an increase in within-country inequality, also shown in Figure 1, a result which might be predicted by economic theory (Burtless, 1995): in particular, it is well-known that the process of trade liberalization creates “winners” and “losers,” as the forces which are responsible for the gains of trade - increased competition, reallocation of capital and labour, shifts according to comparative

advantage—are precisely those which can cause dislocation and hardship for segments of the population.

Governments have attempted to balance the dispersed gains and concentrated losses of trade liberalization through various strategies, devising schemes to compensate the “losers” via policies funded by the “winners,” with the goal of creating a pro-trade consensus (the so-called “embedded liberalism” thesis, see Hays, Ehrlich, and Peinhardt (2005)). Unfortunately, it is entirely possible that compensatory policies may be less effective in convincing the populace of trade’s value if the number of losers reaches a substantial portion of the population or some critical mass (Morrissey, 1995). In this vein, it may be doubly difficult for compensatory policies to hold together a pro-trade coalition if the country’s economic

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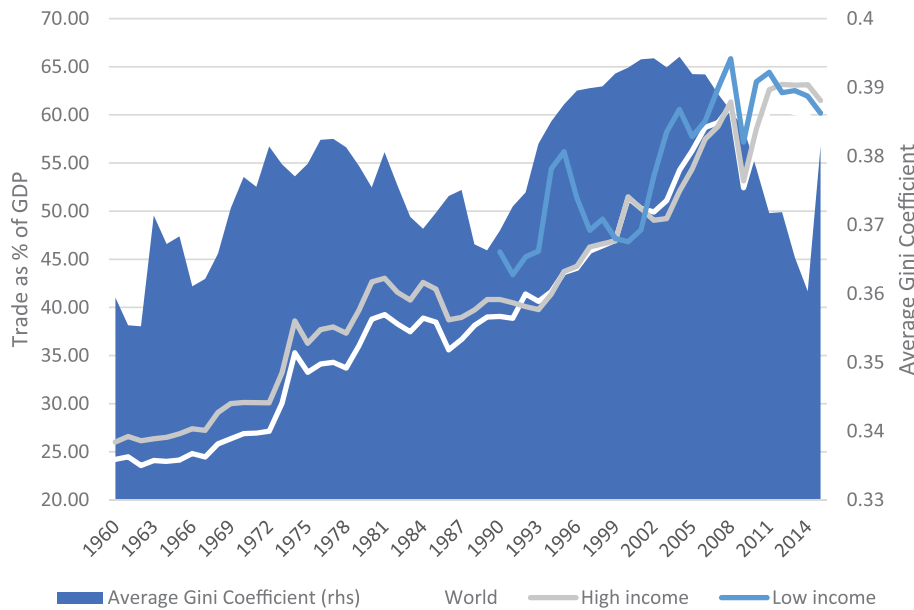


FIGURE 1 Trade as a % of GDP in the World and High/Low Income Countries. Source: World Development Indicators and Author's Calculations from Solt (2016) [Colour figure can be viewed at wileyonlinelibrary.com]

structure itself is contributing to the generation of “losers,” creating a pool of losers from trade larger than it needs to be. In other words, if distortions present in an economy generate an artificially large number of losers compared to an economy absent such distortions, fiscal policies could be strained or, in the worst case, unable to cope with the compensation process. Moreover, an economy that generates too many losers from trade will find itself under constant political pressure to reverse its liberalization, and it is likely even more distortions will be introduced into the country's institutional system, leading to worse economic outcomes.

The purpose of this paper is to examine the conditions under which extra “losers” are generated during the process of liberalization through an examination of the role of institutions in economic transition. The hypothesis of the research is that poor institutions, especially economic ones, can create unnecessary hardship in the transition to greater openness. Indeed, if economic institutions are dysfunctional in some way, they are then likely to hinder the mobility necessary to emerge from trade-induced dislocation, generating inequalities via institutional hysteresis. *Primus inter pares* among these institutions would be property rights, which protect the ability of owners of factors of production to dispose of these factors as they see fit; with poor property rights, transfer incentives are weakened, and the gains of liberalization may pass by unrealized.

The consequence of poor property rights would not be limited to static effects of increasing the number of “losers” from globalization, however, but would also have a dynamic effect of decreasing trade liberalization in the long run. A higher-than-anticipated number of

losers from globalization would generate a much higher burden on compensatory policies, making weaker governments unable to maintain transfers necessary for a pro-trade coalition. In such a situation, excess losses from globalization will make further trade liberalization less likely in the future.

This paper is the first attempt in the literature to link institutions and losers from globalization in an explicit manner. If good institutions can increase trade, and if trade influences institutions, and if trade may create inequality, then how do pre-existing “good” institutions influence trade-generated inequality? Would “good” institutions decrease the number of losers and thus increase political support for continued trade liberalization? Or are institutions merely exerting their effects via the trade channel?

The results of the analysis below confirm that poor institutions create a missing link between trade openness (and opening) and the generation of “losers,” especially in the realm of income inequality. Using three-stage least squares (3SLS) techniques on a new dataset of trade, inequality, and institutions, the analysis shows that good institutions, and in particular property rights, do indeed mitigate losses from trade, lowering inequality in the presence of trade liberalization. This effect is statistically and economically significant and robust to a number of sensitivity analyses. Clearly then, the converse is true: bad institutions do create more losers from globalization than are necessary.

The rest of the paper proceeds as follows. The next section discusses the previous literature and focuses on the oft-quoted but little-debated definition of “losers” from globalization, using this derivation to set up the

identification strategy. Section 3 builds on this previous research to set up the empirical strategy, while Section 4 is devoted to a discussion of the results and sensitivity analyses. Section 5 offers some concluding thoughts and derives policy recommendations going forward.

2 | LITERATURE REVIEW AND THEORETICAL BASIS

2.1 | Who is a “loser?”

The consensus on trade generating “winners” and “losers” often runs into a key obstacle in measuring this effect, and that is precisely defining what makes a “loser.” O’Brien and Leichenko (2003) call attention to this fact, noting that the terms “winners” and “losers” have both political and economic meanings, while the perception of being a “loser” also may be influenced by psychological traits beyond mere economic calculation (Rubin (2002) notes that zero-sum intuition tends to persist in the populace, meaning a tendency to assign “loss” even when there may not be one). From a practical standpoint, given how trade reforms are usually introduced as part of a broad package of liberalization (Falvey, Foster, & Greenaway, 2012), it is often difficult to disentangle specific trade-related effects on certain segments of a country’s workforce. But even if one could entirely isolate the effects of (greater) trade opening on a national economy, we are still left with little guidance on how to clearly separate the losers from the winners.

The extant literature has coalesced around several metrics to define “losers” in the fact of trade-related competition, based mainly on class, income level, and/or source of income. The most common definitions of loser focus on the effects of trade across income distributions, concentrating either on the very poor of a society (Harrison, Rutherford, & Tarr, 2003) or on the relative status of some countries in relation to others (Bouët, Mevel, & Orden, 2007). The theory behind this supposed effect encompasses several facets, including the fact that the poorest segments of society are often located in the informal economy and thus are not poised to reap the gains from globalization (or, alternately, are more exposed to shocks). Another possible channel by which trade could harm the poor involves threatening livelihoods, as poorer workers are generally lower-skilled and unable to compete in a more modern or advanced economy. Ravallion (2006) also notes that trade may not explicitly harm the poor but given that most of the gains of trade are captured by the non-poor, income gaps may widen and attenuate poverty. Finally, removal of trade taxes may threaten government revenue, causing a cutback in state

aid to the poor (Bannister & Thugge, 2001). In each of these scenarios, the poorest are assumed to be the natural “losers” in any trade liberalization.

Despite the intuitive nature of these explanations, the empirical evidence is less uniform on the effects of trade on the poorest, meaning that we may not simply equate “poor” with “losers from trade.” In one of the largest surveys of globalization-related inequality, Milanovic (2013) finds that the losers from globalization are those between the 75th and the 90th percentile in income globally, whose incomes grew much more slowly than other percentiles. Interestingly, however, Milanovic also shows that the poorest 5% benefitted much more than those in the 75th to 90th percentiles, meaning that the poorest segments of society were actually aided rather than devastated by trade. This effect has been echoed by several other studies, which confirm that the poor are also amongst those most advantaged by trade liberalization, due to greater consumer choice and lower prices. Empirical evidence from Dollar and Kraay (2004) demonstrates that, on average, there is a great diversity of winners and losers amongst the poor and there is no systematic or automatic loss among the poorest of society due to globalization, a finding also confirmed by Ravallion (2006). As Topalova (2010) also showed, other factors beyond mere income levels, including institutional arrangements and labour mobility, mattered much more in determining losers in India’s trade liberalization in the early 1990s.

This scenario means that a more precise definition of losers must be sought. Rather than concentrating solely on income levels, the trade literature has instead focused on skill levels (which tend to be correlated with but that do not exclusively overlap with income levels). Davidson and Matusz (2006) are typical of this literature, identifying two groups of losers from liberalization: “stayers” who are stuck in the low-tech sector and “movers” who go through costly training to switch from the low- to the high-tech sector. However, even here there are anomalies. Rudra (2005) shows that effects of globalization on workers are conditional on a country’s level of development; in particular, workers in high-income countries, while nominally lower-skilled, may have greater bargaining power than lower-skilled workers in low-income countries. This theory is supported by the famous work from Lawrence and Slaughter (1993), which found no effect of trade openness on wage levels in the United States. Similarly, Manasse and Turrini (2001) show that trade can actually be beneficial for the lowest-skilled if trade can introduce skill-complementary technology (instead of substitute technology). Barraud and Calfat (2008) also show that sectoral effects are less pronounced under trade liberalization, as Argentina’s globalization alleviated poverty most markedly in the non-tradables sector.

While the disruptions from trade may be necessarily concentrated in manufacturing and lower-skilled industries due to the ease of movement of goods across borders (and the relatively harder road to trade in services, due to cultural, linguistic, and other “local knowledge” factors), that does not mean that there may not be “losers” in other socio-economic strata. Graham (2001) points out that those who see themselves as losers are not necessarily poor, but rather newly vulnerable members of the middle class who perceive that gains from market reforms have gone disproportionately to the top of the income distribution. Kemp (2007) provides a long list of psychological biases that people utilize when assessing gains from trade, and loss aversion combined with erroneous perceptions of “fairness” (grounded in a misreading of utility) figure high in this list, explaining why those with more to lose might consider themselves “losers” already from existing openness to trade. Similarly, Kriesi et al. (2006) note that individuals who have a strong sense of identity with their national community are also likely to perceive themselves as losers under globalization, due to the process of “de-nationalization” which accompanies trade liberalization.

Given these various issues regarding the understanding of who is a “loser” from globalization, perhaps the simplest way to encompass all of the various facets of economic loss is to look at the broader idea of within-country income inequality (Bergh & Nilsson, 2010). Using this as a rough proxy for overall trade-related losses has many benefits: in the first instance, workers or industries disadvantaged by globalization will fall behind in wage earnings or profits, creating a widening gap with those who have successfully taken advantage of globalization. Looking at within-country inequality also may mitigate issues discovered with cross-country analyses, mainly that the development level of an economy matters for determining the impact of trade. By using within-country inequality, the country's benchmark is not against an idealized representative worker, but rather against the country's own income distribution historically. Moreover, as inequality is a relative setting, its use as a metric for losers may also capture the alternative definitions mooted above, including economic insecurity from the middle class. Finally, while there are numerous sources of income inequality, many of these may be controlled for in an econometric setting, leaving much of any widening gap attributable directly to trade. In other words, while we may not be able to observe all of the channels in which trade may create losers, we can view the output variable of income inequality after the fact; by controlling for the other sources of inequality, the residual from this examination could thus plausibly be attributed to globalization.

2.2 | How do institutions affect the number of losers?

Having chosen a broad metric to understand the “losers” from globalization, the next step is to understand the theory behind how institutions and trade could interact to mitigate or exacerbate trade-related inequality. Recent work seems to provide evidence for the fact that trade openness *ceteris paribus* increases inequality, albeit not in a linear fashion. In particular, Rojas-Vallejos and Turnovsky (2017) show how tariff reductions can increase short-term inequality, while admitting that the increase in demand and economic activity can offset such losses for the poorest sectors of society in the longer run. In a similar vein but introducing the issue of reverse causality, Katsimi and Moutos (2010) also show a U-shaped relationship between inequality and tariffs, with low levels of inequality associated with higher tariff rates which then decline and eventually rebound; the highest levels of inequality are then associated with the highest tariff rates. The authors note that this is likely a form of redistribution, but it is also plausible that high levels of protectionism are a cause of inequality, rather than a response to it.

Given the reality that losers are indeed created by globalization, this paper is fashioned around two separate hypotheses, derived from the previous literature and focused on the role of institutions in this relationship. The first hypothesis is:

H1 Countries with poor institutions create more losers from trade than those with good institutions.

As noted, a wealth of literature exists relating trade and inequality but a comparatively smaller literature has modelled either the effect of institutions on inequality or the effects of trade on institutions (and vice versa). What research does exist, however, shows a connection between poor institutional quality and inequality globally (Chong & Calderon, 2000; Chong & Gradstein, 2007; Lin & Fu, 2016) while also accounting for the disruptive nature of trade liberalization. Globalization can properly be thought of as a process, a temporary event which can reorient an economy's structure but with effects that are often permanent. The challenge in adapting to this longer-term structural disruption comes down to a country's incentive structure; with proper incentives, the disruption occasioned by globalization can become an opportunity, allowing for resources to shift and adjust to take advantage of the new competitive environment. Where incentives are flawed or blocked in some way, the adjustment is likely to take a much longer time (if at all), leading to unnecessary deadweight losses across an economy.

Institutions enter into this theoretical relationship due to the fact that they are creators, enforcers, and guarantors of various incentive structures in society. Writ large, institutions can then be said to mediate returns to factors of production precisely via the power they exert on incentives, altering relative prices through information dispersion or negatively via transaction costs or cultural and organizational barriers. In fact, if an institution does not perform well at guaranteeing a growth-friendly incentive structure or if the institution is designed explicitly to create barriers (such as in rigid labour markets), institutions can retard the gains from trade (Kapstein, 2000). With the gains from trade vitiated, not only do the costs from trade remain but they are often increased, meaning that poorly-functioning institutions not only reduce the number of winners but increase the number of losers.

As already hinted at, “institutions” are not an amorphous lump and, in reality, are highly differentiated by function and form (Hartwell, 2013). With regard to the link between institutions and inequality in the presence of globalization, the most prominent institutional mechanism that has been surveyed is the labour market, including employment protection legislation (EPL), unionization, minimum wages, and the like. The theoretical link between rigid labour market institutions and inequality is ambiguous: on the one hand, minimum wages and employment protection are meant to mitigate against poverty, providing assistance for lower-skilled professions, thus ensuring employment and lessen income gaps. On the other hand, there is ample theoretical and empirical evidence that such institutions could exacerbate inequality, with minimum wages and unions advantaging insiders to the detriment of outsiders, and EPL could reduce job turnover and labour mobility, trapping individuals in lower-paying positions (as Topalova (2010) notes in the case of India). Jaumotte and Osorio Buitron (2015) provide evidence for both sides of this coin, noting that eroding minimum wages can lead to higher inequality, while large-scale collective bargaining increases unemployment and thus inequality.

While labour market institutions are the most obvious link to inequality outcomes, there is a strong case to be made for other institutions having a powerful effect on creating or mitigating losses in society. In particular, property rights, embodied in contracting institutions and the protection of the right of ownership, should theoretically have a mitigating influence on income inequality. Chong and Gradstein (2007) lay out a straightforward case for the relationship, noting that contract enforcement, as embodied by an independent judiciary, allows for the poor to extract rents as well as the rich. When those rights are missing, rich and particularly powerful

elites may expropriate assets from the poor and/or refuse the poor access to the economic system. Similarly, following along the lines of de Soto's (2000) thesis, a lack of property rights may mean that potential assets held by the poor cannot be translated into tangible capital or collateral; thus, income mobility is restricted, and inequality widens. There is also a strong feedback effect from inequality to property rights, meaning that inequality can also decrease property rights as elites attempt to cling to their spoils (Glaeser, Scheinkman, & Shleifer, 2003; Sonin, 2003).

Finally, democratic institutions should also have an impact on income inequality. Part of the way in which democracy would impact inequality is through the choice of labour market institutions, as noted above, but it may also be reflected in fiscal policies, as politics could choose to create programs targeted precisely at compensating the losers (Perotti, 1996). Such an approach could quell social tensions while also creating credible commitment for continued redistribution in the future (Acemoglu & Robinson, 2000), a fact which would track with the ongoing process of globalization and perhaps mitigate its effects. Empirical evidence for the effects of democracy are mixed, with Simpson (1990), working before the great wave of globalization of the 90s, who found that there was also a U-shaped relationship between democracy and inequality: higher levels of democracy corresponded with low inequality, but medium levels of democracy exacerbated it. Other studies, such as Rodrik (1998), show a stronger and linear association between democracy and lessened inequality, while other work advances the idea that inequality may actually be lower in authoritarian regimes (Gradstein & Milanovic, 2004). Turning to the idea of democracy in the presence of economic openness, however, Reuveny and Li (2003) clearly show that democracy and economic openness both reduce income inequality over a sample of 69 countries.¹ This result is in line with what is expected by theory and is also part of this supposition.

H2 Countries with more losers from trade have slower trade liberalization progress.

As noted above, the effects of poor institutions are not static unfortunately, and can create a vicious cycle, where increased inequality feeds back into institutional deterioration (Savoia, Easaw, & McKay, 2010). If already-poor institutions are allowed to decline further, it can be expected that inequality in a country would also continue to worsen (along with other economic indicators, as in the case of Venezuela today), creating even more losers (Gradstein, 2008). The pressure on institutions could result in a prolonged underdevelopment trap alleviated

only by radical institutional reform or economic crisis (or, in many cases, both).

The first set of institutions likely to suffer from increased inequality are political ones, such as democracy or the rule of law. Chong and Gradstein (2007) demonstrate empirically the feedback effects between institutions and inequality and show that inequality is directly tied to poorer-quality political institutions. Similarly, Licht, Goldschmidt, and Schwartz (2007) note that economic inequality (as measured by Gini coefficients) predicts both the rule of law and democratic accountability, with higher levels of inequality associated with a lower rule of law. Seen from a political economy vantage point, this result is not surprising, as one would assume that high pre-existing levels of inequality would persist mainly due to political barriers to entry. To express it another way, inequality remains or even widens due to increasing restrictions placed on the political system, with insiders colluding to keep outsiders on the outside. In this manner, already-poor institutions are frozen in place or deteriorate in a way that is beneficial to those at the top of the income ladder.

While the effect of inequality may be most pronounced in political institutions, there is also evidence that economic institutions can also be degraded from prolonged inequality. Keefer and Knack (2002) note that social polarization is bad for property rights, showing that inequality leads to a more interventionist government with short time-horizons, willing to expropriate in period 1 for increased revenues with no thought as to the consequences in period 2 (a similar argument, noting that less inequality leads to stronger rights, is made by Gradstein (2007)). Likewise, in countries with a highly stratified income distribution, broader property rights may be opposed by richer elements of society who have invested in their own private rights, a situation that is found in many transition countries of the former Soviet Union (Sonin, 2003). In this scenario, politically-earned inequality (a common source of inequality across the globe) creates its own further barriers to entry in the form of weak property rights, ossifying the status quo and reducing income mobility.

This second hypothesis thus takes into account these facts and extends the reasoning further to note that trade itself, a type of economic institution, will likely suffer from inequality. In other terms, if trade may create inequalities, and poor institutions create even more inequality, and inequality creates poor institutions, economic inequality can plausibly be expected to harm further moves towards globalization. In this sense, we would expect to see significant feedback effects not only from institutions and inequality, as in Chong and Gradstein (2007), but also from inequality to trade.

3 | METHODOLOGY AND DATA

In order to examine the relationships between inequality, openness, and institutions, the identification strategy follows from the theory described above, taking into account the high level of endogeneity inherent in the trade/institutions/inequality nexus. In particular, as noted in the previous section, trade shapes institutions (Martin & Steiner, 2016), and inequality also shapes institutions, while at the same time institutions influence inequality and vitiate the benefits of trade. To model these effects econometrically, we use a theoretically-motivated simultaneous equations system based on a three-stage least squares (3SLS estimator) similar to de Macedo, Pereira, Martins, and Jalles (2013) and Mustafa, Rizov, and Kernohan (2017); the three simultaneous equations utilized are derived from the literature on the determinants of the respective dependent variable, shown below:

3.1 | Inequality

As already noted, the main research question of this paper is to tie in trade and institutions to inequality, a task helped by the recent explosion in inequality-related research (as shown in Section III). Building off of this literature review and the large number of significant covariates noted above, the headline equation for inequality is structured as:

$$\begin{aligned} INEQ_{it} = & \alpha TRADE_{it} + \beta INSTITUTIONS_{it} \\ & + \gamma TRADE*INSTITUTIONS_{it} + \delta X'_{it} + \mu_t + \epsilon_{it}, \end{aligned} \quad (1)$$

where INEQ is income inequality, TRADE is the standard measure of trade openness (exports plus imports as a percentage of GDP), INSTITUTIONS are proxies for specific institutions, TRADE*INSTITUTIONS is an interaction term between the two, X' is a vector of controls, μ_t are country-specific effects, and ϵ is an error term specific to each country-year pair.

A key issue will of course be how one measures the dependent variable for “inequality” in Equation 1, and for this examination we will use several metrics. The first and most expansive one is derived from Solt (2016), who provides the largest and most complete estimates of Gini Indexes available today. This approach allows for a calculation of within-country income inequality, an indicator we hope will capture the proportion of winners and losers after globalization. Underscoring the uncertainty which comes with obtaining a precise estimate of the

Gini coefficient, Solt offers a hundred variables per country-year pair; to simplify the calculations done here, we average these estimates to obtain one Gini coefficient per country per year (where available).

In addition, between-country inequality may also proxy for those “left behind” by globalization, as the increased proportion of losers may actually subsume the winners and manifest itself in lower growth. As in many other papers (and first explored in Sala-i-Martin, 1996), we use the framework of sigma convergence to measure between-country inequality, constructing a dispersion metric equal to the standard deviation of a country's log per capita GDP versus all other countries in that year. As Li, Squire, and Zou (1998) note, much of variation in inequality does not actually occur within-country, but across countries; in this sense, seeing aggregate losses from trade may be a better metric to understand the role of globalization and institutions.

The headline equation of inequality shown above also contains the key variable of interest, an interaction term between trade openness and institutions. This variable, in addition to the level effects of trade openness and institutions in isolation on inequality, is intended to capture the relationship between inequality and trade in the presence of good/poor institutional structures (Hypothesis 1 above).

Finishing off the empirical exercise for this equation will be a series of control variables, derived from the literature and following closely in line with Dabla-Norris, Kochhar, Suphaphiphat, Ricka, and Tsounta (2015) and Jaumotte and Osorio Buitron (2015). To avoid potentially serious misspecification and overidentification errors, the control set is kept parsimonious, but includes: measures of national income (GDP per capita, at its levels and squared, to capture Kuznets-type effects as shown in inter alia De Gregorio & Lee, 2002); labour market institutions (proxied here by the national unemployment rate); democracy (on the theory that inequality is tolerated less in a democracy, measured here by the ICRG indicator for democratic accountability); government spending (to capture transfer payments and the social safety net); deviations in growth over a 5-year window (in order to capture productivity or, more accurately, the Balassa-Samuelson effect, see Caporale, Hadj Amor, and Rault (2014); an interaction term between productivity (the aforementioned growth deviations) and the chosen metric of property rights²; resource endowments (rents as percent of GDP, to capture Dutch Disease and politically-created rents); female mortality (as a proxy for gender inequality); and human capital (proxied by both the initial level of secondary enrolment and the “Human Capital Index” from the World Economic Forum).

3.2 | Institutions

The second equation of note here determines the forces driving the levels of institutional efficiency in a country, in particular the levels of property rights and, to a lesser extent, democratic accountability. While there is a large literature on the effects of institutions on trade, inequality, and other metrics (notably growth), there are however small clues as to the determinants of institutional levels over a shorter time-span than millennia. Mijiyawa (2013) has laid out an impressive first attempt to understand the determinants of property rights, modelling rights according to several schools of thought, derived from theoretical pieces stretching back hundreds of years. Similarly, Barro (1999) was one of the first economic examinations of the determinants of democracy, finding several similarities to Mijiyawa's analysis in the linkages between development, human capital, and institutions.

Of direct relevance for this research question, Mijiyawa (2013) also notes a strong and significant negative relationship between property rights and a country's Gini coefficient, likely accounting for the use of political (rather than market) power to acquire property, institutionalizing inequality to those not politically-connected. Similarly, in relation to democracy, it is possible that inequality also harms democratic accountability, as the elite seek to stifle access to political levers in order to keep economic power for themselves (Venezuela and Russia are excellent examples of this trend in recent years). In this sense, economic inequality may perpetuate political inequality, as the rule-makers write regulations and pass laws in order to limit political competition (in a classic example of cartel behaviour). Moreover, specific economic policies may also be undertaken in order to stifle political competition, such as loose monetary policies (favouring those first in line to receive cash), while strong property rights may mitigate against deterioration of democracy.

Given this theoretical backing, the equation relating institutions to their determinants is thus:

$$INSTITUTIONS_{it} = \alpha TRADE_{it} + \beta INEQ_{it} + \rho Y'_{it} + \mu_t + \epsilon_{it} \quad (2)$$

where *INSTITUTIONS* is the institution in question (property rights or democracy), *TRADE* and *INEQ* are as shown in Equation 1 above and *Y'* is a vector of controls. Property rights are measured in this analysis by two separate measures, one objective and one subjective: the objective indicator is contract-intensive money (CIM), introduced by Clague, Keefer, Knack, and Olson (1999)

and representing the proportion of money held inside the formal banking sector, while the subjective indicator is the ICRG's measure of investor protection (measuring the risk of expropriation). Each measure has some gaps in its coverage (for CIM the gaps relate to years, while for the ICRG indicator not all countries are covered), but together they help to form a complete picture of property rights. Completing the specification, the controls for the property rights specification are derived from Mijiyawa (2013), and include natural resource rents, latitude, level of democracy, population size, financial market development, labour market efficiency (proxied by the unemployment rate), initial GDP per capita, initial levels of education, and dummies for legal origin (from the database devised by La Porta, Lopez-de-Silanes, and Shleifer (2008)).

By contrast, democracy is measured by the ICRG measure of democratic accountability, coded from 1 to 6 with higher numbers representing more democracy. For this set of controls, as Mijiyawa (2013) and Hartwell (2014) note, GDP growth, the presence of strong property rights, financial market development, inflation (as a proxy for monetary policy), legal origin, and initial levels of education (as a proxy for demand for democracy) may all correlate with levels of democracy. Thus, they are included here.

3.3 | Trade openness

The final relationship in the series of equations shown here examines the determinants of trade liberalization (globalization) itself. Similar to the equation on institutions, there is also a dearth of research in the extant literature on this topic; although gravity equations remain the workhorse of international trade modelling on a bilateral basis, there is less work on the determinants of aggregate trade flows or a country's overall trade stance. Guttman and Richards (2006) are a notable exception, transposing standard gravity variables (and adding additional plausible covariates) to a model of aggregate trade flows for a large cross-section of countries (170 in total) across six five-year periods. Their examination, once again tracking the gravity literature, finds that country size as proxied by both population and area are the main determinants of trade openness, with smaller landmasses and smaller populations trading much more extensively. Property rights have a small but significant effect, a finding which holds across specifications. In a similar vein, Bleaney and Neaves (2013) find that size matters but has been declining over time (they provide no estimation on the effect of institutions on trade, however).

For this paper, the underlying trade openness equation will rely on both of these papers for its set of

covariates. But of particular interest for us is, as noted in Hypothesis 2 above, whether or not inequality harms further trade liberalization. This equation, the third leg of the triangle, seeks to answer this question via the inclusion of inequality as a right-hand variable, relating inequality to the level of a country's trade openness. Moreover, to capture the dynamic effects of inequality on trade openness, we also include one-, five-, and ten-year lags of the inequality metrics noted above.

$$TRADE_{it} = \alpha INSTITUTIONS_{it} + \beta INEQ_{it} + \tau Z'_{it} + \mu_t + \epsilon_{it} \quad (3)$$

The controls utilized in this final equation, derived from the aforementioned literature, posits trade openness as a function of (in addition to inequality and property rights), size, population, and other country-specific traits: these will include democracy (to understand the willingness of the population to open to competition); latitude (to proxy for geography and the effect of the tropics); whether a country is landlocked (to proxy for remoteness); country size (for scale effects); resource endowment (resource rents as a percentage of GDP); human capital (proxied by secondary education enrolment); labour market efficiency; investment potential (initial levels of schooling); government spending (which correlates with higher trade openness, see Adsera & Boix, 2002); access to finance and/or financial depth (bank deposits to GDP, to show ability to take advantage of trade opportunities); and the structure of the economy (agriculture as a percentage of GDP). By restricting the analysis to these metrics, we hope to capture the vast majority of determinants of trade liberalization/globalization without undue white noise. Such an approach, as with the other equations, will also help to alleviate misspecification errors across the 3SLS estimation.

The data for this exercise, comprising these various variables, was compiled from a large number of publicly available sources, including Solt (2016), the World Bank's World Development Indicators (WDI), the International Country Risk Guide (ICRG), the IMF's International Financial Statistics (IFS), previous research, and many other sources. A complete list of variables, definitions, and sources is shown in Table 1 and summary statistics are shown in Table 2.

4 | RESULTS

The results of the empirical exercise for both hypotheses are shown in Tables 3 and 4. Given the space constraints involved in showing the results of the three equations, it

TABLE 1 Variables, definitions, sources

Variable	Source	Description
Average Gini coefficient	Solt (2016)	Average of Solt's 100 annual observations per country of the Gini coefficient
Average Gini coefficient*democracy	Author's calculations	Interaction of Gini coefficient and democratic accountability
Bank deposits as % of GDP	World Bank WDI	Demand, time and saving deposits in deposit money banks as a share of GDP
Democratic accountability	ICRG	Extent of responsiveness of a government to its people, rated from 1 to 6, with higher number indicating more democracy
Female mortality	World Bank WDI	Female mortality rate, per 1,000 female adults, ages 15–64
French legal origin dummy	La Porta et al. (2008)	Dummy taking the value of 1 if a country had the specific legal origin, 0 if otherwise
Government spending as % of GDP	World Bank WDI	All government current expenditures for purchases of goods and services (including compensation of employees), as % of GDP
Human capital index	World economic forum	Assesses learning and employment outcomes across 5 distinct age groups, on a scale from 0 (worst) to 100 (best)
Initial GDP per capita	Author's calculations from World Bank data	GDP per capita from the first year available
Initial secondary enrolment ratio	Author's calculations from World Bank data	Secondary enrolment ratio from the first year available
Investor protection	ICRG	Risk of expropriation, contract enforcement, and repatriation of profits, scored on a scale from 0–12 with higher numbers indicating better protection
Labour quality	The conference board	Contribution of labour quality to GDP growth, measure by changes in the composition of the workforce (based on Employment and wages by educational attainment)
Land area	World Bank WDI	Total land area in square kilometres
Landlocked dummy	CEPII GeoDist database	Dummy taking the value of 1 if a country is landlocked, 0 otherwise
Latitude	CEPII GeoDist database	Actual latitude of a country's capital city
Log GDP per capita	World Bank WDI	GDP per capita
Log GDP per capita squared	World Bank WDI	Quadratic term on GDP per capita
Log of population	World Bank WDI	Population in millions, log-linearized
Private credit as % of GDP	World Bank WDI	Financial resources provided to the private sector by financial corporations, including loans, purchases of non-equity securities, and trade credits and other accounts receivable
Property rights (contract-intensive money)	Author's calculations from IMF international financial statistics data	M2 less currency held outside formal banking institutions as a percentage of M2. See also the text
Resource rents as % of GDP	World Bank WDI	Sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents as % of GDP
Scandinavian legal origin dummy	La Porta et al. (2008)	Dummy taking the value of 1 if a country had the specific legal origin, 0 if otherwise
Sigma convergence	Author's calculations	Country standard deviation of GDP per capita against the mean GDP of all countries for that year
Trade openness as % of GDP	World Bank WDI	Sum of exports and imports of goods and services measured as a share of GDP
Trade*contract-intensive money	Author's calculations	Interaction term of trade openness and CIM

(Continues)

TABLE 1 (Continued)

Variable	Source	Description
Trade*democratic accountability	Author's calculations	Interaction of trade openness and democratic accountability
Trade*investor protection	Author's calculations	Interaction term of trade openness and investor protection
UK legal origin dummy	La Porta et al. (2008)	Dummy taking the value of 1 if a country had the specific legal origin, 0 if otherwise
Unemployment rate	International labour office	Number of unemployed persons as a percentage of the total number of persons in the labour force

TABLE 2 Summary statistics

Variable	N	Mean	SD	Min	Max
Average Gini coefficient	4,281	0.382	0.089	0.198	0.609
Average Gini coefficient*democracy	2,800	1.592	0.560	0.000	3.405
Bank deposits as % of GDP	7,605	37.980	37.833	0.000	479.670
Democratic accountability	4,242	3.787	1.666	0.000	6.000
Female mortality, 15–64 years	10,286	197.739	123.834	31.589	799.382
French legal origin dummy	10,864	0.505	0.500	0.000	1.000
Government spending as % of GDP	7,783	15.926	7.605	0.000	156.532
Human capital index	6,065	2.102	0.722	1.007	3.734
Initial GDP per capita	10,864	6.318	1.417	3.703	10.316
Initial secondary enrolment ratio	10,360	40.842	30.727	0.000	98.983
Investor protection	3,678	7.404	2.524	0.000	12.000
Land area (in sq. km)	10,445	680,129	1,854,781	20	16,400,000
Landlocked dummy	10,864	0.180	0.385	0.000	1.000
Latitude	10,528	18.680	24.184	−44.283	64.150
Log GDP per capita	8,584	7.480	1.685	3.548	11.688
Log GDP per capita squared	8,584	58.794	26.005	12.588	136.617
Log of population	10,827	15.158	2.120	9.174	21.039
Private credit as % of GDP	7,517	35.642	33.256	0.001	312.118
Property rights (contract-intensive money)	2,862	0.816	0.148	0.139	1.000
Resource rents as % of GDP	7,480	7.136	11.170	0.000	89.166
Scandinavian legal origin dummy	10,864	0.031	0.173	0.000	1.000
Sigma convergence	8,584	0.180	0.122	0.000	1.557
Standard deviation of growth, 5-year window	7,562	0.106	0.082	0.003	0.855
Trade openness as % of GDP	8,120	79.290	54.584	0.000	860.800
Trade*contract-intensive money	2,781	71.675	50.811	6.565	441.212
Trade*democratic accountability	4,006	317.560	262.717	0.000	2,628.941
Trade*investor protection	3,501	628.279	542.664	0.000	5,299.246
UK legal origin dummy	10,864	0.340	0.474	0.000	1.000
Unemployment rate	4,500	9.048	6.338	0.100	37.600

was decided to display only the “headline” equation (i.e., Equation 1 above) expressing inequality as a function of trade openness and institutional quality.³ The first

specification, shown in Column 1 of Table 3, looks at the effects of property rights on inequality, with property rights proxied by contract-intensive money and inequality

TABLE 3 Results of baseline regressions

	Average Gini coefficient			
	1	2	3	4
Trade openness	0.02	−0.002	0.01	−0.0003
	<i>4.79***</i>	<i>1.67*</i>	<i>4.34***</i>	<i>0.27</i>
INSTITUTIONAL VARIABLES				
Property rights (contract-intensive money)	2.11		1.18	
	<i>5.30***</i>		<i>4.72***</i>	
Property rights (investor protection)		0.04		0.03
		<i>1.43</i>		<i>1.19</i>
Democratic accountability	−0.03	−0.01	0.00	−0.03
	<i>6.36***</i>	<i>1.62</i>	<i>1.04</i>	<i>2.27**</i>
Contract-intensive money*trade openness	−0.02		−0.010	
	<i>4.73***</i>		<i>3.94***</i>	
Investor protection*trade openness		0.001		−0.0001
		<i>0.74</i>		<i>1.09</i>
Democratic accountability*trade openness			−0.0003	0.0003
			<i>5.48***</i>	<i>2.29**</i>
CONTROLS				
GDP per capita	0.15	0.20	0.14	0.18
	<i>4.34***</i>	<i>11.08***</i>	<i>7.09***</i>	<i>10.39***</i>
GDP per capita 2	−0.01	−0.01	−0.008	−0.01
	<i>4.80***</i>	<i>11.52***</i>	<i>7.32***</i>	<i>10.62***</i>
Productivity	1.04	1.32	0.6100	0.49
	<i>2.25**</i>	<i>1.74*</i>	<i>2.15**</i>	<i>1.12</i>
Productivity*property rights	−1.20	−0.17	−0.70	−0.06
	<i>2.15**</i>	<i>1.72*</i>	<i>2.04**</i>	<i>1.12</i>
Resources to GDP	−0.001	−0.0040	0.0002	0.0003
	<i>2.36**</i>	<i>0.98</i>	<i>0.07</i>	<i>0.51</i>
Unemployment	0.003	0.003	0.005	0.003
	<i>5.13***</i>	<i>5.66***</i>	<i>8.24***</i>	<i>7.49***</i>
Initial secondary enrollment	−0.001	−0.002	−0.001	−0.002
	<i>5.69***</i>	<i>9.01***</i>	<i>8.24***</i>	<i>10.09***</i>
Female mortality	0.0001	0.0002	0.0001	0.0002
	<i>2.98***</i>	<i>3.67***</i>	<i>3.04***</i>	<i>5.32***</i>
Population	−0.01	−0.002	−0.0020	0.00
	<i>3.44***</i>	<i>0.95</i>	<i>1.10</i>	<i>0.70</i>
Human capital index	−0.03	0.03	−0.01	0.040
	<i>3.01***</i>	<i>2.76***</i>	<i>1.07</i>	<i>3.61***</i>
Government spending	−0.005	−0.002	−0.004	−0.004
	<i>5.33***</i>	<i>2.50**</i>	<i>7.73***</i>	<i>5.70***</i>
C	−1.52	−0.55	−1.08	−0.44
	<i>4.57***</i>	<i>3.68***</i>	<i>5.21***</i>	<i>3.56***</i>
n	1,091	1905	906	1,569
R-squared	<i>0.11</i>	<i>0.05</i>	<i>0.49</i>	<i>0.52</i>

Note: Absolute value of t-statistics in italics, *, **, and *** denoting significance at 10%, 5%, and 1% levels respectively.

TABLE 4 Results of sigma convergence regressions

	Sigma convergence			
	1	2	3	4
Trade openness	-0.010 <i>4.52***</i>	-0.003 <i>2.06**</i>	-0.010 <i>5.33***</i>	-0.003 <i>2.94***</i>
INSTITUTIONAL VARIABLES				
Property rights (contract-intensive money)	-1.21 <i>5.96***</i>		-1.18 <i>5.92***</i>	
Property rights (investor protection)		-0.07 <i>1.91*</i>		-0.04 <i>2.57***</i>
Democratic accountability	0.006 <i>2.76***</i>	0.01 <i>3.48***</i>	-0.01 <i>2.44**</i>	0.010 <i>1.15</i>
Contract-intensive money*trade openness	0.01 <i>4.56***</i>		0.01 <i>5.20***</i>	
Investor protection*trade openness		0.0003 <i>2.14**</i>		0.0003 <i>3.10***</i>
Democratic accountability*trade openness			0.0002 <i>4.40***</i>	-0.00002 <i>0.17</i>
CONTROLS				
GDP per capita	-0.57 <i>19.74***</i>	-0.51 <i>28.68***</i>	-0.57 <i>20.17***</i>	-0.51 <i>27.57***</i>
GDP per capita 2	0.03 <i>20.39***</i>	0.03 <i>28.50***</i>	0.030 <i>20.14***</i>	0.03 <i>26.09***</i>
Productivity	-0.78 <i>3.04***</i>	-1.73 <i>1.56</i>	-0.7100 <i>2.60***</i>	-0.6200 <i>2.04**</i>
Productivity*property rights	0.79 <i>2.49**</i>	0.21 <i>1.46</i>	0.7300 <i>2.15**</i>	0.0700 <i>1.69*</i>
Resources to GDP	-0.001 <i>1.56</i>	0.0010 <i>2.12**</i>	-0.0002 <i>0.50</i>	0.002 <i>2.39**</i>
Unemployment	-0.004 <i>6.02***</i>	-0.004 <i>6.49***</i>	-0.004 <i>6.21***</i>	-0.004 <i>6.56***</i>
Initial secondary enrollment	0.0010 <i>6.13***</i>	0.0010 <i>6.72***</i>	0.001 <i>6.07***</i>	0.001 <i>6.58***</i>
Female mortality	0.00010 <i>2.81***</i>	0.00060 <i>2.27**</i>	0.0007 <i>1.91*</i>	0.00004 <i>1.85*</i>
Population	-0.0009 <i>0.39</i>	-0.002 <i>0.71</i>	-0.002 <i>0.75</i>	-0.01 <i>3.44***</i>
Human capital index	-0.02 <i>1.65*</i>	0.00 <i>0.32</i>	-0.01 <i>1.05</i>	-0.007 <i>0.64</i>
Government spending	0.003 <i>4.10***</i>	0.003 <i>3.97***</i>	0.003 <i>3.87***</i>	0.003 <i>4.25***</i>
C	3.44 <i>18.87***</i>	2.66 <i>13.81***</i>	3.48 <i>19.50***</i>	2.57 <i>25.65***</i>
n	906	1,569	906	1,569
R-squared	<i>0.58</i>	<i>0.50</i>	<i>0.57</i>	<i>0.68</i>

Note: Absolute value of t-statistics in italics, *, **, and *** denoting significance at 10%, 5%, and 1% levels respectively.

TABLE 5 Granger-causality tests

(a) Common coefficient test				
Null hypothesis	Lags	Obs	F-statistic	Prob.
Income inequality does not Granger cause trade openness	4		2.02025	0.089*
Trade openness does not Granger cause income inequality		3,485	2.87139	0.022**
Income inequality (–5 years) does not Granger cause trade openness	4	3,132	3.55478	0.007***
Trade openness does not Granger cause income inequality (–5 years)			0.83373	0.504
Income inequality (–10 years) does not Granger cause trade openness	4	2,549	4.00152	0.003***
Trade openness does not Granger cause income inequality (–10 years)			0.04032	0.997
(b) Dumitrescu and Hurlin (2012) individual coefficient test				
Null hypothesis	Lags	W-stat	Z-bar tilde	Prob.
1960–1990				
Income inequality does not Granger cause trade openness	2	3.968	2.414	0.02**
Trade openness does not Granger cause income inequality		7.751	3.101	0.002***
Income inequality (–5 years) does not Granger cause trade openness	1	3.25	1.81	0.07*
Trade openness does not Granger cause income inequality (–5 years)		0.65	–0.89	0.373
1990–2015				
Income inequality does not Granger cause trade openness	1	2.663	2.43	0.02**
Trade openness does not Granger cause income inequality		1.922	1.005	0.315
Income inequality (–5 years) does not Granger cause trade openness	1	2.461	2.04	0.04**
Trade openness does not Granger cause income inequality (–5 years)		2.439	2.00	0.05**
Income inequality (–10 years) does not Granger cause trade openness	1	2.729	2.556	0.01***
Trade openness does not Granger cause income inequality (–10 years)		2.10	1.345	0.179
1990–2005				
Income inequality does not Granger cause trade openness	1	2.85	4.7603	0.000***
Trade openness does not Granger cause income inequality		3.252	6.064	0.000***
Income inequality (–5 years) does not Granger cause trade openness	1	3.06	5.439	0.000***
Trade openness does not Granger cause income inequality (–5 years)		2.38	3.212	0.001***
2000–2015				
Income inequality does not Granger cause trade openness	1	2.4852	2.3255	0.02**
Trade openness does not Granger cause income inequality		2.0306	1.3512	0.177
Income inequality (–5 years) does not Granger cause trade openness	1	2.5724	2.5122	0.01***
Trade openness does not Granger cause income inequality (–5 years)		2.1299	1.564	0.118

Note: (A) Lags chosen on the basis of an unrestricted VAR with minimized information criteria. *, **, and *** denote significance at 10%, 5%, and 1% levels respectively. (B) Lags chosen on the basis of Akaike information criteria. *, **, and *** denote significance at 10%, 5%, and 1% levels respectively.

proxied by Gini dispersion. The first thing that jumps out immediately is that, across our dataset, it appears that both property rights and trade openness have a statistically significant and positive association with income inequality.

However, as predicted by our theory, property rights and trade openness interacted together do have a mitigating effect (albeit the scale is not as large as the inequality predicted by strong property rights).

Swapping out the CIM indicator with the ICRG investment profile to capture property rights is done in the model shown in Column 2, and the change in variable results in a much larger number of observations but much weaker results. In particular, the relationship between trade openness and inequality is weakly negative, while property rights show a slightly positive but insignificant correlation with inequality (and the interaction between the two is also insignificant). Part of the reason behind this change can be attributed to what the two metrics of property rights are measuring: as Hartwell (2017) notes, the ICRG measure can be thought of as a measure of *potential* property rights, encompassing legislation and the like, while contract-intensive money is a metric of *realized* property rights, including enforcement and expectations. In this sense, what our two sets of results are thus capturing are two different effects, the effect of well-written property rights legislation on inequality and the effect of well-enforced rights on the same. Seen in this light, legislation has little effect on inequality, while good contractual enforcement, by protecting rights, can lead to higher inequality through market-based rewards. Future research calls for a way to involve state capacity in this equation.

Turning to the effects of democracy on inequality in the face of globalization, democracy was already included in the first two base specifications on property rights, and in both it showed a dampening effect on inequality (as predicted by theory). Including the interaction term between openness and democracy in Columns 3 and 4 (replicating the earlier regressions with two separate proxies for property rights), we see that the influence of democracy turns insignificant by itself in Column 3, but that there is a negative effect on inequality in the face of trade openness and more democracy. On the other hand, using the legislative measure for property rights in Column 4, democracy appears to continue to have a negative effect on inequality at the 5% level of significance, but in the face of trade openness, it has a marginally positive effect on inequality (with property rights and trade having no effect). This result holds subject to a series of robustness tests (not shown here), including interacting democracy with an executive constraints measure, to see if executive discretion is driving the results, and using an alternate measure of democracy (the *polity2* measure from the Polity IV database). Given the radically different number of observations in this specification, as well as issues encountered when including the population and resource measures (which were dropped here), these results must be treated with caution.

As noted earlier, the use of the Gini coefficient as a measure of income inequality may be subject to its own issues, as noted by Li et al. (1998), so a metric of

between-country inequality should also be utilized to capture net losses attributable to globalization. This sigma convergence measure, a simple dispersion of standard deviations, would theoretically improve under globalization, as factor prices and competition spread the benefits of trade; also, theoretically, the only sticking point to such an adjustment could be the presence of poor institutions not allowing the benefits of trade to accrue.

Table 4 shows the results of using sigma convergence as a dependent variable, and the effect of institutions on this outcome. Trade openness by itself appears to unequivocally reduce between-country inequality, with the same economic significance across specifications. With regard to property rights, it appears that it too has a strong negative association with between-country inequality no matter which metric of rights is used (in distinction to within-country inequality). Interacting property rights and trade openness, however, also returns a consistent result, and that is a divergence in incomes across countries. Given the structure of this analysis, we cannot say which portion of the income distribution is driving these results, but a plausible explanation is that property rights help to make poorer countries richer (decreasing inequality); on the other hand, property rights and trade openness help to make richer countries even richer, increasing inequality.

Turning to the effects of democracy (Columns 3 and 4 of Table 4), they also have somewhat surprising results, in that democracy taken alone has very little effect, but democracy interacted with trade openness appears to slightly widen inequality when using contract-intensive money as a proxy for property rights. Including investor protection and legislative guarantees of property rights, democracy appears to have little correlation with between-country inequality, failing to be significant in the specification shown in Column 4. Property rights continue to behave as earlier.

For the final question, on whether or not inequality can force a slowdown of trade liberalization, there are several approaches we may utilize to examine this question empirically. The first, and most simple, is the concept of Granger-causality (Granger, 1969) which, different from pure causality in the non-economic sense, can enlighten us to the movements of economic statistics and their relations to each other. With lag lengths selected via an unrestricted VAR and where the majority of information criteria was minimized, the results of a common coefficient Granger-causality test are shown in Table 5, panel A. Perhaps unsurprisingly, there is two-way Granger-causality between trade openness and income inequality taken in the same year (Granger-causality tests the null of no causality; a rejection of the

TABLE 6 Is trade openness affected by inequality?

	Trade openness					
	1	2	3	4	5	6
Average Gini coefficient	485.65	405.91				
	<i>6.08***</i>	<i>5.96***</i>				
Gini 5-year lag			91.15	122.35		
			<i>3.92***</i>	<i>4.94***</i>		
Gini 10-year lag					47.83	107.75
					<i>1.67*</i>	<i>5.20***</i>
INSTITUTIONAL VARIABLES						
Property rights (contract-intensive money)	-60.09		97.83		160.08	
	<i>1.36</i>		<i>2.04**</i>		<i>3.41***</i>	
Property rights (investor protection)		8.77		9.81		8.96
		<i>4.00***</i>		<i>5.10***</i>		<i>4.27***</i>
Democratic accountability	2.23	-1.05	-2.50	-2.43	-4.00	-2.92
	<i>1.41</i>	<i>0.90</i>	<i>1.70*</i>	<i>2.39**</i>	<i>2.55***</i>	<i>2.96***</i>
CONTROLS						
Initial GDP per capita	9.40	7.36	6.86	7.60	4.81	7.63
	<i>5.25***</i>	<i>5.47***</i>	<i>4.13***</i>	<i>5.22***</i>	<i>2.84***</i>	<i>5.51***</i>
Productivity	222.23	351.08	367.6300	252.59	516.23	320.24
	<i>1.43</i>	<i>4.24***</i>	<i>1.91*</i>	<i>5.15***</i>	<i>2.86***</i>	<i>4.00***</i>
Productivity*property rights	-330.08	-45.01	-478.4700	-45.08	-650.00	-29.50
	<i>1.60</i>	<i>4.18***</i>	<i>1.96*</i>	<i>5.14***</i>	<i>2.89***</i>	<i>3.81***</i>
Resources to GDP	1.18	1.08	0.97	0.94	0.75	0.74
	<i>4.81***</i>	<i>4.57***</i>	<i>4.84***</i>	<i>4.77***</i>	<i>3.55***</i>	<i>4.29***</i>
Unemployment	-2.62	-1.35	-0.49	-0.11	-0.40	-0.22
	<i>5.09***</i>	<i>3.88***</i>	<i>1.93*</i>	<i>0.52</i>	<i>1.39</i>	<i>1.05</i>
Initial secondary enrollment	0.31	0.17	-0.01	-0.20	0.07	-0.21
	<i>2.35**</i>	<i>1.42</i>	<i>0.16</i>	<i>2.59***</i>	<i>0.94</i>	<i>2.63***</i>
Land area	-0.00004	-0.00006	-0.00005	-0.00006	-0.00005	-0.00005
	<i>8.49***</i>	<i>10.59***</i>	<i>10.83***</i>	<i>12.48***</i>	<i>10.62***</i>	<i>11.58***</i>
Landlocked	19.59	13.33	14.05	12.71	14.11	13.36
	<i>5.60***</i>	<i>5.15***</i>	<i>4.52***</i>	<i>5.20***</i>	<i>4.39***</i>	<i>5.65***</i>
Latitude	0.43	0.39	0.31	0.30	0.32	0.30
	<i>7.75***</i>	<i>6.20***</i>	<i>9.40***</i>	<i>8.90***</i>	<i>10.68***</i>	<i>9.56***</i>
Government spending	2.64	2.14	1.12	0.88	0.72	0.85
	<i>7.30***</i>	<i>5.88***</i>	<i>3.68***</i>	<i>4.19***</i>	<i>2.18**</i>	<i>3.67***</i>
Bank deposits	0.28	0.44	0.12	0.43	0.02	0.41
	<i>4.39***</i>	<i>9.49***</i>	<i>1.78*</i>	<i>9.50***</i>	<i>0.34</i>	<i>9.52***</i>
C	-180.53	-253.80	-95.07	-116.46	-105.23	-101.62
	<i>4.61***</i>	<i>6.70***</i>	<i>3.47***</i>	<i>6.91***</i>	<i>4.10***</i>	<i>6.34***</i>
n	906	1,569	873	1,499	812	1,375
R-squared	0.02	0.22	0.26	0.37	0.27	0.54

Note: Absolute value of t-statistics in italics, *, **, and *** denoting significance at 10%, 5%, and 1% levels respectively.

TABLE 7 Trade openness and inequality redux

	Dependent variable: Trade openness					
	1	2	3	4	5	6
Average Gini coefficient	1969.58 <i>4.35***</i>	621.34 <i>3.56***</i>	1,085.09 <i>3.76***</i>	265.82 <i>1.09</i>	1969.58 <i>4.98***</i>	621.34 <i>2.74***</i>
Gini coefficient*democracy	-354.67 <i>4.19***</i>	-97.73 <i>2.85***</i>				
Gini 5-year lag* democracy			-162.59 <i>3.41***</i>	-19.18 <i>0.48</i>		
Gini 10-year lag*democracy					-354.67 <i>4.80***</i>	-97.74 <i>2.34**</i>
INSTITUTIONAL VARIABLES						
Property rights (contract-intensive money)	-301.91 <i>2.56***</i>		-145.52 <i>1.73*</i>		-201.91 <i>2.12**</i>	
Property rights (investor protection)		8.83 <i>4.48***</i>		8.87 <i>3.47***</i>		8.83 <i>3.72***</i>
Democratic accountability	146.30 <i>4.11***</i>	37.69 <i>2.63***</i>	67.41 <i>3.27***</i>	5.67 <i>0.34</i>	146.30 <i>4.68***</i>	37.69 <i>2.07**</i>
Controls?	YES	YES	YES	YES	YES	YES
n	906	1,569	884	1,499	906	1,569
R-squared	<i>0.27</i>	<i>0.34</i>	<i>0.47</i>	<i>0.36</i>	<i>0.27</i>	<i>0.34</i>

Note: Absolute value of t-statistics in italics, *, **, and *** denoting significance at 10%, 5%, and 1% levels respectively.

null implies that X Granger-causes Y). But as we use deeper lags, going back to Gini coefficients from five and ten years previously, we see that the causality is unidirectional, running exclusively from income inequality to trade policies and not the other way around.

As a check on this examination, given the heterogeneity of our dataset, it is plausible that each individual country may have its own version of Granger causality, and thus we also utilize the Dumitrescu and Hurlin (2012) test for panel data. The Dumitrescu and Hurlin test allows coefficients to differ across individuals, using an average of Wald statistics from country-specific regressions to test the null that there is no Granger-causality between the ordered variables; as Lopez and Weber (2017) note, the results show how there can be causality for some individuals but not necessarily for all.

Given that the routines for this test across all statistical packages require strongly balanced data—and our dataset is definitely unbalanced—the test has been conducted on various subsets of the data which are balanced over various time periods.⁴ The results of this are shown in Table 5, panel B, and, despite which sub-set of the entire panel is utilized, the results from the common coefficient tests hold, namely that income inequality influences trade openness but not necessarily the other

way around. For the longest balanced panel we were able to utilize (from 1990 to 2015), the results are sharpest and also allow for the inclusion of the ten-year lag of inequality; while inequality and trade openness appear to interact even at a five year lag, by the tenth year, it is inequality which is exerting influence on trade openness and not vice versa.⁵ Again, while this is not true causality in the accepted sense of the word, both of these tests show that past values of income inequality contain information that help to predict the level of trade openness above and beyond the information contained in a country's previous experience with trade openness.

Moving back into a multivariate framework, we may better understand the relationship between the two factors via the constituent equations of the previous analyses below the headlines, using trade openness as the dependent variable and inequality as an independent variable. These results are shown in Table 6, Columns 1 and 2, and the results are somewhat surprising—across the two headline specifications, high inequality correlated with trade openness in a statistically and economically significant manner (while the effects of property seem to be mostly positive and that of democracy small but generally negative). Perhaps these results need to be taken with a note of caution: as these numbers are capturing

simultaneous effects, there could be other prior factors driving the results apart from the corrected-for endogeneity. Given the simultaneous nature of the system, much as was done with the Granger-causality tests, we also include lags of up to 10 years for the Gini coefficient, trying to see if previous income disparities in an economy could have generated. Unfortunately for this hypothesis, while the scale of the effect does decay, there is no evidence (Columns 3 through 6) that inequality leads to changes in globalization or behaviour in trade policy. Much as in the baseline specification, inequality, even at deeper lags, continues to be associated with much higher levels of trade openness.

Finally, there is a chance that these specifications are missing something important, namely that income inequality by itself has little effect on trade openness without a method for expressing dissatisfaction, that is, the democratic process. For this final check, we re-run the original and the augmented regressions including an interaction term between the Gini coefficient of a particular year (simultaneous and at 5 and 10-year lags) and democracy. The results, shown in Table 7, confirm this hypothesis, as the interaction between democracy and inequality has a significant and largely negative effect on a country's trade openness (the outsize coefficients are based on an increase in the Gini coefficient of one, which is of course the largest amount any country's Gini can increase; thus, partial increases in equality as captured in percentage change in the Gini will lead to much lower effects than are seen here). These results show that, while democracy may encourage trade openness in general and inequality may be correlated with trade, prolonged inequality is detrimental in the long run for globalization. Succinctly stated, too many losers from trade, given a choice at the ballot box, may indeed agitate for less trade in the long term.

5 | CONCLUSIONS

This paper has taken a new look at the question of trade winners and losers by examining the nexus between trade openness, institutions, and income inequality. The results, while sensitive to choices of institutional metrics and calling for much deeper research, show that institutions can indeed mitigate trade-induced losses, even as they provide the needed signals for the reallocation of resources in an economy. Furthermore, while prolonged inequality is no guarantee of protectionist policies, continued losses from the dislocations accompanying trade in a democracy can indeed provide a brake on further globalization.

From a policy standpoint, the recommendations appear to be rather self-evident, as it would behove a country to ensure its fundamental institutions are sound in order to reap the full benefits of globalization. As theory would predict, there is necessarily an element of inequality that comes from trade, with winners and losers always present, as trade is not an equilibrium concept: moving goods, services, and payments around the world implies a search for greater consumer and producer surplus, and thus the dislocations of that chase will always be present. Given this reality, good institutions may actually help to exacerbate this inequality in the short-term via a reallocation of incentives as well as resources. However, as the analysis above has shown, good institutions may help such disruption to be short-lived and mitigate the necessary dislocation of globalization, meaning that trade dislocation is always present but is relatively far less painful than it could be in an environment of greater distortions. Thus, ensuring that property rights and democratic accountability are respected, protected, and inviolable should be a priority for any government facing globalization.

It is also self-evident, from a political economy perspective, that such a recommendation is easier said than done. For many countries, especially Latin American ones which have undergone abrupt gyrations in their institutional environments, the legacy of "bad" institutions may persist even long after "good" institutions are in place (moreover, there may be additional confounding variables related to culture and informal institutions which can counteract formal institutions). Political orderings, types of democracy (Acemoglu, Egorov, & Sonin, 2010), and even the precise combination of institutions (Acemoglu & Robinson, 2006) can all have an impact, and the fact that institutions are semi-permanent may mean that their influence persists long beyond their formal abandonment. However, Harberger (1998:21) noted that "Releasing [an] economy from its trammels, correcting an accumulation of past mistakes, can sometimes set in motion a prolonged episode of astounding growth". In this sense, the concept of the "second best" in trade distortions may also apply, as any move towards better institutions would obviously be more welfare-improving than remaining in a downward spiral.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTES

- ¹ Despite this result, Reuveny and Li do not include an interaction term for openness and democracy, as we do here.
- ² Thanks to an anonymous referee for suggesting both the inclusion of the Balassa-Samuelson effect and the interaction term.
- ³ Additional results in the system of equations are available from the author upon request.
- ⁴ The test is run on Stata 15 using the command `xtgcause`, with lag length chosen by the usual information criteria (AIC, BIC) and with bootstrapped standard errors (1,000 repetitions performed).
- ⁵ The Dumitrescu and Hurlin test requires a T of at least 8 per panel to run, and in the forced balanced database, many panels did not have both the capacity for a 10-year lag of the inequality metric and a series of at least eight observations. Thus, the only sub-set where this was feasible was the 1990–2015 set.

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