

DETERMINANTS OF INEQUALITY IN LATIN AMERICA AND EASTERN
EUROPE

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ABSTRACT

Bilyana Petrova: Determinants of Inequality in Latin America and Eastern Europe
(Under the direction of John D. Stephens)

How do structural transformations affect the income distribution in Latin America and Eastern Europe? This dissertation reveals that deindustrialization, the expansion of the service sector, and the growth of the commodity-producing sector have a meaningful impact on market, or pre-taxes-and-transfers, income inequality. This effect depends on each economy's human capital endowments, on the type of primary goods that it specializes in, and on the ability of different commodities to contribute resources to governments' coffers.

Chapter 2 focuses on the manufacturing and the service sectors. I argue that a higher proportion of the labor force employed in services is linked to higher market income inequality in both regions. The service sector is very diverse, with different productivity and skill levels, which means that income differentials tend to be higher among workers. In contrast, deindustrialization is likely to have a differential effect on inequality in the two regions. A larger industrial sector is correlated with lower market income inequality in Eastern Europe. This is because the region's skill endowment is sufficiently high to keep the educational premium low. This is very different from Latin America, where the industrial sector is capital-intensive and qualified workers are scarce, driving the educational premium up. Consequently, a larger industrial sector in Latin America is associated with higher market income inequality.

Chapter 3 examines dynamics in the primary sector in Eastern Europe. I argue that the decline in the proportion of the labor force employed in agriculture exacerbated market income differentials during the 1990s and the 2000s. The sector had provided jobs for low-skill workers whose employment prospects were highly unfavorable in the years of the transition. The loss of these jobs as the sector modernized hurt low-income households particularly hard. The inflow of primary goods imports had a similar effect

on the income distribution as it drove many local producers who could not withstand competitive pressures out of the market. As a result, domestic producers of commodities transitioned to a capital-intensive method of production. Because of this, exports of primary goods from the region are also correlated with rising income inequality.

Chapter 4 analyzes similar processes in Latin America, which has been a major commodity producer throughout its history. I find that higher agricultural employment, crop and food production, and foods and metals exports are associated with lower market income inequality across Central and South America during the 1990s and the 2000s. In contrast, rising fuel exports are correlated with widening income differentials. Specialization in the production of commodities (excluding fuels) generates income gains for the low and the middle classes and decreases the income share of the top quintile. When Central American countries are excluded from the analysis, however, the effect of the primary sector on market income inequality is weaker and less conclusive. Food exports in continental Latin America are associated with higher inequality while fuel exports and crop and food production lose statistical significance. These findings reveal the different importance, composition, and profile that the primary sector has across the region and suggest that commodity production absorbs more labor in Central America.

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Chapter 1

INTRODUCTION

At the time of writing, Latin America is the world's most unequal region. Its average pre-taxes-and-transfers income GINI coefficient exceeded 0.50 in 2015 (Darvas 2016). Its disposable income GINI was slightly lower at 0.47 (Darvas 2016, CEPAL 2017). Variation in living standards, work conditions, and access to education, health care, and social services remains substantial (World Bank 2014). A focus on wealth paints an even darker picture. In 2014, the richest 10% controlled 71% of Latin America's wealth (CEPAL 2016). Between 2002 and 2015, the fortunes of the region's billionaires increased by an average of 21% per year – six times faster than the growth of Latin America's GDP (Oxfam 2016). Meanwhile, around 30.7% of the region's population, or 168 million people, lived in poverty in 2016. Extreme indigence affected 10%, or 61 million citizens (CEPAL 2017). Consistent with the region's historical trajectory, inequality remains “a distinctive, pervasive characteristic of [Latin America]” (Gasparini and Lustig 2011, Bourguignon and Morrison 2002).

Although bleak, these numbers hide the noticeable progress that the region has made at ameliorating disparities and addressing socio-economic deficits. Income inequality declined in twelve out of the seventeen Latin American countries for which data are available during the 2000s (Lopez-Calva and Lustig 2010, Szekely and Mendoza 2017). This decrease was not negligible – the GINI coefficient registered an average annual fall of 1.1 percentage points between 2000 and 2007 (Lopez-Calva and Lustig 2010). Rapid economic growth brought about income gains across the income distribution while the expansion of redistributive social programs boosted the fortunes of the poorest (Szekely and Mendoza 2017, Huber and Stephens 2012, Lopez-Calva and Lustig 2010, Pribble 2014,

Garay 2017). Diverse social policies undertaken by both left- and right-wing governments increased access to education, health care, and old-age pensions (Huber and Stephens 2012, Levitsky and Roberts 2011). As a result, income differentials declined, indigence decreased, the middle classes grew, and social protection expanded to cover previously excluded populations (Lustig 2015).

The experience of Central and Eastern Europe¹ has been very different. Eastern Europe has historically had low levels of economic inequality. The establishment of communism in the 1940s brought about a variety of policies seeking to eliminate unemployment, suppress income differentials, and expand access to education, health care, and pensions (Haggard Kaufman 2008, Cerami and Vanhuyse 2009, Orenstein 2008).² The socialist status quo, however, eventually proved unsustainable in the long run. The transition to market capitalism after the collapse of the Berlin Wall noticeably raised the levels of poverty and inequality in the area (Milanovic 1998, Gerry and Mickiewicz 2008). In the course of a few years, economic uncertainty escalated, life expectancy declined precipitously, indigence rose, living standards deteriorated, and the distribution of income approached or even exceeded the levels of dispersion typical of the advanced industrialized world (Orenstein 2008). Confronted with the imperative to balance budgets and build social protection programs capable of addressing the new socio-economic challenges created by the transition, these states redefined eligibility criteria, established new schemes, and increased reliance on the private sector for the provision of social services (Cerami and Vanhuyse 2009).

The late 1990s and the early 2000s witnessed economic stabilization. Years of uninterrupted rapid growth decreased unemployment, reduced poverty and brought income gains across the income distribution. While the 2010 Sovereign Debt crisis affected the region and revealed its vulnerability to external shocks, Eastern European countries faced a less

¹By Central and Eastern Europe I refer to the countries which formed part of the Communist Bloc between the 1940s and the late 1980s. My particular focus in this project is on the ten states which joined the European Union in the 2004 and the 2007 enlargement waves (Bulgaria, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia). Hereafter Eastern Europe.

²These reforms hid substantial disparities in wealth and living standards between members of the nomenklatura and other citizens.

painful recession than many members of the eurozone. Nevertheless, income inequality continued to rise throughout the region.³ Although this increase has slowed in pace, it has proven resilient, suggesting that the region might have arrived at a new status quo following decades under a regime that artificially suppressed income differentials. And while Eastern European countries have sought to redress some of these imbalances through social policy, the success of this strategy has been put to the test as the welfare state retrenched to accommodate pressures to maintain fiscal discipline. As a result, income inequality is much higher in the region today than it used to be at the beginning of the transition.

What explains these diverging trends? Why has income inequality behaved differently across Eastern Europe and Latin America? More broadly, what are the factors that affect the income distribution in the global periphery in an age of intensifying economic interdependence? Recent years have witnessed heightened academic interest in the causes of economic inequality around the world. This interest is justifiable given the repercussions that economic disparities have for a variety of other political and social phenomena. Existing scholarship links growing income differentials to violent conflict, democratic erosion, declining political participation, and higher political polarization (Solt 2011, 2012, and 2015, Boix 2003, Acemoglu and Robinson 2005). Inequality can also influence states' prospects for democratization and democratic consolidation (Ansell and Samuels 2014, Houle 2009). It shapes governments' willingness and ability to promise reparations (Greenstein unpublished) and redistribute income (Petrova unpublished). Recent studies also connect it to the intensifying backlash against globalization in the advanced industrialized world (Han 2016, Burgoon 2012). Given its variegated effects, income inequality is indeed a "defining challenge of our time" (Obama 2013).

Identifying its drivers therefore becomes crucial not only for addressing existing disparities but also for devising effective solutions to other social problems. A rich literature examines changes to the income distribution in advanced capitalist democracies, highlighting the role of globalization, technological change, the prominence of left-wing

³The only exception to this trend appears to be the Czech Republic.

parties, the decline of unions, the retrenchment of the welfare state, and the growth of the financial sector (Huber and Stephens 2001, Huber, Huo and Stephens 2018, Brady et al. 2003). A smaller, but rapidly growing stream of research looks beyond the advanced industrialized world, focusing instead on less-developed countries. Apart from corroborating the causal importance of the previously mentioned variables (Huber and Stephens 2012, Morgan and Kelly 2013, Levitsky and Roberts 2011, Lopez-Calva and Lustig 2010), this work has also illuminated the specific pressures unique to emergent economies (Appel and Orenstein 2015, Mahutga and Bandejl 2010).

Although this research has greatly enhanced our understanding of income inequality, much remains unknown about the drivers of economic disparities. Indeed, the focus of most studies has been on differences in disposable, or post-taxes-and-transfers, income. In contrast, the distribution of market income has received much less attention (Choi 2017, Morgan and Kelly 2013). This is deeply problematic for several reasons. First, pre-taxes-and-transfers income inequality reflects the impact of underlying economic transformations much better than disposable income inequality. It thus has the potential to reveal structural changes that redistribution might obscure. These structural changes might have important implications for individual political attitudes, voting behavior, party system reconfigurations, and welfare state reform. Recent work on the rise of populist and radical right parties in advanced capitalist democracies links the emergence and popularity of these actors to dissatisfaction with the profound transformations affecting these societies (Beramendi et al. 2018, Burgoon 2018). Citizens' perceptions of risk, which partly stem from these changes, shape preferences for the type and extent of redistribution, therefore affecting public pressures and mobilization in support for social reforms (Rueda 2005, Rueda and Thewissen 2018, Rhem 2016). Furthermore, ethnographic studies carried out in the United States and the United Kingdom suggest that structural economic changes affect trust in government, opposition to immigration and globalization, support for anti-establishment actors, and citizens' perceptions of being forgotten and neglected by national governments, especially when these changes are not accompanied by effective government action (Gest 2016, Cramer 2016). A focus on the

market income distribution and its drivers can therefore shed light on other important political and socio-economic questions.

Second, market income inequality illuminates dynamics in net income inequality. The two measures are strongly linked. This is especially true outside of the advanced capitalist societies of Western Europe, North America, and the Antipodes. Welfare states remain underdeveloped or truncated in many less developed countries (Holland 2017, Haggard and Kaufman 2008). The coverage and generosity of social protection programs in these societies are frequently much lower than in the advanced industrialized world. Government redistribution, or the extent to which the state alleviates inequality, is notoriously low in Latin America, for example. While access has expanded in recent years, social protection systems are highly segmented, granting citizens unequal access to social services and often leaving out marginalized or disadvantaged groups (Holland unpublished, Pribble 2013, Huber and Stephens 2012). Although much more generous and inclusive, welfare states in Eastern Europe also face considerable challenges. Social spending as a proportion of GDP is much lower in post-communist states than it is in OECD countries (OECD...). Furthermore, redistribution fluctuated enormously during the transition away from socialism when governments struggled to rebuild their economies. Therefore, understanding the causes of market income inequality is essential for understanding net economic inequality in these regions.

This project seeks to contribute to this understanding. It examines the drivers of market income inequality in Latin America and Eastern Europe. These two regions are not generally analyzed together in the political economy literature. This is surprising because, despite the undeniable differences in their histories, Latin America and Eastern Europe share some notable similarities. Both regions faced severe economic crises in the 1980s or the early 1990s. As a result, both confronted the imperative to restructure their economies and implement neoliberal policies. Although the speed and comprehensiveness of these reforms differed, they were similar in content and consequences, promoting the retreat of the state from economic affairs and fostering these economies' incorporation into the global economic system. This integration unfolded during a period of deepen-

ing globalization and intensifying competitive pressures. Said pressures were particularly strong in the global periphery, which remains strongly dependent on foreign demand and capital for its internal development. This reliance therefore gives rise to specific incentives and constraints. Consequently, policy-makers had to navigate a complex environment characterized by limited autonomy, enhanced structural business power, and the emergence of new needs. Exploring how the structural transformation of the economy induced by the dismantling of internal protection and the policy courses political elites chose to pursue therefore has the potential to shed light on dynamics in the distribution of income.

This focus is relatively novel. Although existing work has analyzed multiple dimensions of the economic change that Latin America and Eastern Europe undergone during the 1990s and the 2000s, it has not explicitly linked these changes to income inequality. While a rich literature discusses deindustrialization, the expansion of the services sector, and specialization in the production of commodities, few studies have directly assessed the implications of these processes for the income distribution. This is especially true for the most recent literature. Furthermore, despite the proliferation of analyses that investigate the political constellations behind social policy reform (Niedzwiecki 2016, Niedzwiecki and Pribble 2017, Anria and Niedzwiecki 2016, Pribble 2013, Ponce de Leon unpublished, Huber and Stephens 2012, Dunn and Huber unpublished, Borges Sugiyama 2011, Fairfield 2016), little work focuses on economic and labor market policy, which also have important implications for income inequality, especially the pre-taxes-and-transfers income distribution.

My dissertation argues that structural transformations in general, and dynamics in the industrial, the services, the agricultural, and the extractive sectors in particular, matter for income inequality in Latin America and Eastern Europe. Shifts in the relative size of these sectors – especially in their ability to absorb labor and contribute to national (and local) budgets – have the potential to affect employment dynamics and wage dispersion. The impact of these economic shifts on the income distribution is magnified when national governments adhere to the same type of economic and labor market policies and exhibit a

considerable degree of policy continuity over time. In the absence of departures from the neoliberal policy status quo, economic transformations related to deindustrialization, the expansion of services, and the growth of the commodity-producing sector, shape income inequality. Simultaneously, these policies equilibria can generate “inequality traps” that might become increasingly difficult to overcome in the future (Kelly 2009 and 2018). A more detailed outline of the argument (and a roadmap to the three chapters) follows below.

Chapter 2 explores the impact of two structural economic transformations – the decline of the manufacturing sector and the expansion of the services sector – on the income distribution in Latin America and Eastern Europe. Both processes affect wage dispersion by shaping the relative demand for labor, the composition of the labor force, and the educational premium. I argue that a higher proportion of the labor force employed in the services sector is associated with higher market income inequality in both regions. Services are exceptionally heterogeneous, with workers’ productivity and skills varying across different occupations. As a result, income differentials tend to be higher among services sector workers. In contrast, deindustrialization is likely to have a differential effect on inequality in the two regions. A larger industrial sector is correlated with lower market income inequality in Eastern Europe. This is because manufacturing has historically been highly labor-intensive, providing employment for a significant fraction of the labor force. The disappearance of state-owned industrial enterprises left many jobless and disproportionately hurt the poor. Even though manufacturing has become increasingly capital-intensive in recent years, the high skill endowment inherited from the communist period keeps the educational premium low. This is very different from Latin America, where the industrial sector is strongly linked to commodity extraction and the collapse of import-substitution industrialization eventually led to capital-intensive manufacturing. The jobs generated by the sector therefore target highly qualified workers, who are scarce in the region. Growing demand for such workers contributes to a rising educational premium. Consequently, a larger industrial sector in Latin America is associated with higher market income inequality. Results from the cross-sectional time-series analysis run

against both regions show robust support for these expectations.

Chapters 3 and 4 complement this analysis of structural economic transformations by focusing on the primary sector. Chapter 3 examines dynamics in Eastern Europe. Following decades within the structures of the Council for Mutual Economic Assistance, post-communist governments dismantled barriers to trade and re-established commercial relations with the rest of the world. Combined with a process of technological renovation and restitution of previously expropriated land, this process entailed deep restructuring of their primary sector. I argue that the decline in the proportion of the labor force employed in agriculture exacerbated market income differentials in Eastern Europe. The sector had provided jobs for low-skill workers whose employment prospects were highly unfavorable in the years of the transition. The loss of these jobs as the sector modernized hurt low-income households particularly hard. The inflow of primary goods imports had a similar effect on the income distribution as it drove many local producers who could not withstand competitive pressures (and did not have equal access to the European Union's enormous market) out of the market. As a result, domestic producers of commodities consolidated and transitioned to a different, more capital-intensive method of production. Because of this, exports of commodities from the region are also correlated with rising income inequality. Fixed effects and Prais Winsten models run against the ten countries in my sample confirm these expectations.

Chapter 4 analyzes similar processes in Latin America. Despite attempts to diversify production and limit its dependence on primary goods, the region has been a commodity producer throughout its history. Reliance on the extractive sector has intensified since the adoption of market-oriented reforms in the 1980s and the 1990s. How have dynamics in this sector affected the income distribution? I find that higher agricultural employment, crop and food production, and foods and metals exports are associated with lower market income inequality across Central and South America. In contrast, rising fuel exports are correlated with widening income differentials. Specialization in the production of commodities (excluding fuels) generates income gains for the low and the middle classes and decreases the income share of the top quintile. When Central American countries are

excluded from the analysis, however, the effect of the primary sector on market income inequality is weaker and less conclusive. Food exports in continental Latin America are associated with higher inequality while fuel exports and crop and food production lose statistical significance. These findings reveal the different importance, composition, and profile that the primary sector has across the region and suggest that commodity production absorbs more labor in Central America.

In sum, this dissertation shows that structural economic transformations play an exceptionally important role in shaping the income distribution in Latin America and Eastern Europe. In a context of policy inertia, structural dynamics determine the availability of different employment opportunities, shape the educational premium, and generate resources that states can use toward redistribution. Neglecting these structural dynamics and only focusing on the implementation of reforms that break with the status quo paints an incomplete picture of the factors that drive economic inequality.

Chapter 2

ECONOMIC STRUCTURE AND MARKET INCOME INEQUALITY IN LATIN AMERICA AND CENTRAL AND EASTERN EUROPE

2.1 Introduction

On November 8th, 2016, Republican-backed businessman Donald Trump defeated Democratic nominee Hilary Clinton and won the US presidential election. Trump had run a campaign centered on promising to bring high-paying manufacturing jobs back to America. The decline of industry, he argued, had weakened the country, undermined its economic independence, deprived millions of American citizens of their livelihoods, and plunged communities into poverty and despair. Furthermore, Trump argued, the decrease in American industrial jobs had exacerbated income inequality (Trump 2016). As a result, while the financial elite prospered, the former industrial bases in the heartland of the United States were slowly disappearing. According to Trump's historical narrative, the collapse of manufacturing employment had decimated the middle classes and left America deeply polarized.

Although Trump's story is incomplete and unclear, this account of the structural causes of economic inequality is consistent with the literature on the Organization for Economic Cooperation and Development (OECD). Existing scholarship has linked rising income differentials to underlying structural transformations caused by intensifying globalization, technological change, and neoliberal reforms. Deindustrialization is the crucial link in this causal chain. According to existing research, automation and competition with low-wage developing countries have destroyed manufacturing jobs in the advanced industrialized world, leading to a rising educational premium and a polarized employment structure (Acemoglu et al. 2016, Autor et al. 2016, 2017 a and b, Campbell and Lusher 2016, Pierce and Schott 2015; Kollmeyer 2013 and 2015). The adoption of

market-oriented reforms and the resulting weakening of trade unions have further exacerbated this trend (Huber and Stephens 2001). These theoretical treatments thus identify the decline of industry and the transition to a service-oriented economy as being partly responsible for the rise of income inequality in the OECD area.

While these theories have received empirical support in work on the advanced industrialized world, they have been subjected to less scrutiny in the context of the global periphery. It is this periphery that Trump views as benefiting from the process of economic integration. Nevertheless, much remains unknown about the impact of economic transformations on the income distribution outside of the OECD area. Although recent work has discussed the risk of premature deindustrialization in the emerging economies of Africa and East Asia (Wu 2016, Milanovic 2016, Rodrik 2015), it has paid less attention to other regions of the world that, rather than being currently enmeshed in these changes, have already undergone similar processes. Latin America and Central and Eastern Europe have received particularly little consideration. This is puzzling, given the important role that structural change has played in shaping inequality dynamics there. The literature's lack of attention to the effects of deindustrialization on income inequality thus precludes a more complete understanding of the implications of economic restructuring.

In fact, by focusing exclusively on the OECD area, the modern discourse on economic inequality has neglected the considerable diversity in middle- and low-income countries' experience with inequality in the aftermath of their integration into the global system of production. Some of these states have indeed witnessed increasing income dispersion as they entered the structures of the new global economy. The collapse of communism, for instance, brought about a steep rise in wage dispersion in Central and Eastern European societies (Milanovic 1998; Gerry and Mickiewicz 2008; Forsters et al. 2003). Other countries, however, have successfully reduced income differentials in recent decades. For example, Latin America's income distribution was more equal in 2010 than in 1990 (Madrid et al. 2010, Levitsky and Roberts 2011; Huber and Stephens 2012; Pribble 2014; Lustig et al. 2013 and 2014; Cornia 2014; Darvas 2016). These diverging trajectories have contributed to a substantial decline in global inequality (Lakner and Milanovic 2016,

Milanovic 2016) and invite further inquiry into the determinants of income dispersion around the world. They also raise questions about the extent to which current theoretical frameworks apply outside the OECD area.

I seek to answer this question by examining the relationship between structural change, as exemplified by deindustrialization and the growth of the service sector, and economic inequality in Latin America and Central and Eastern Europe. Although these regions are not usually compared in cross-regional work, their historical and economic circumstances provide an excellent opportunity to tease out the causal mechanisms linking inequality to structural transformations. Throughout the twentieth century, both regions adopted interventionist development models that spurred industrialization. Following the severe economic crises that they faced in the 1980s and the 1990s, both of them confronted the imperative to restructure their economies and implement neoliberal policies. Although the speed and comprehensiveness of these reforms varied, they were similar in content and consequences, promoting the retreat of the state from economic affairs and fostering incorporation into the global economic system. In both cases, this integration brought about deindustrialization. Nevertheless, income inequality levels both between and within Latin America and Eastern Europe continue to exhibit noticeable variation. What explains the persistence of this variation despite the similar processes that countries in these regions faced in the last twenty years? How do traditional theories about economic transformations apply to them?

In this paper, I argue that the transition to a service-based economy exacerbated market income inequality in both regions. This is partly because the service sector is more heterogeneous than the manufacturing sector, with remuneration rates varying much more widely across different occupations. Highly specialized, high value-added professions that demand high skills and levels of education coexist with low value-added jobs that do not require specific training or qualifications. As a result, wage dispersion is greater in services than in manufacturing. Thus, the expansion of this sector is associated with higher income inequality in both regions.

Nevertheless, the impact of the shift away from industry differs between Latin America

and Central and Eastern Europe. I posit that the industrial sector has had an equalizing effect in the post-communist area. Under communism, it absorbed a large proportion of the labor force. Its collapse after the fall of the Berlin Wall left millions of people jobless, which exacerbated income differentials. The decline of manufacturing in the region, however, was delayed by Western European producers that relocated there in search of lower costs and convenient locations. Manufacturing, therefore, continued to generate employment opportunities in the post-communist countries. Even though the sector became more capital-intensive with time, the educated labor force in Eastern Europe was able to handle this transition. Since differences in productivity in manufacturing are lower than in services, industry ameliorates the polarization of the employment structure.

In contrast, industry in Latin America has traditionally been characterized as capital- and technology-intensive. After the collapse of import-substitution industrialization in the 1970s and the 1980s, local manufacturing ceased to absorb a large proportion of the labor force or to generate jobs for low-skill workers. In fact, mining, which relies on high-skill, highly specialized labor, constitutes a much larger part of industry in Latin America. In a context characterized by low educational attainment levels, its expansion has the potential to further raise the educational premium and thus drive up income inequality. The types of restructuring that countries in Latin America and Eastern Europe experienced and the position that they occupy in the global system of production thus have important repercussions for national income distributions.

The argument outlined above enriches our understanding of the relationship between economic structure and market income dispersion in the global periphery. It provides valuable insights that contradict the often-repeated story that deindustrialization necessarily exacerbates income differentials. This points to the need to pay more careful attention to structural dynamics when studying inequality. Understanding these dynamics is crucial for analyzing the implications of subsequent policy choices. This is especially true for countries whose welfare states cannot effectively reduce inequality through redistribution, either due to underdevelopment, which is the case in Latin America, or instability, which continues to be the case in Central and Eastern Europe. Furthermore,

if scholars seeking to explain the trajectory of inequality do not have this first piece of the puzzle right, subsequent studies can misinterpret the effects of economic policymaking and misrepresent the repercussions of policy inertia on the income distribution.

Practically speaking, properly identifying the factors that shape this distribution is becoming increasingly important. In late 2013, former United States President Barack Obama described rising income inequality as the “defining challenge of our time” (Obama 2013). In her World Economic Forum address in Davos, Christine Lagarde, the managing director of the International Monetary Fund (IMF), characterized income differentials as corrosive to growth and social cohesion (2017). Existing scholarship links growing economic inequality to violent conflict, democratic erosion, intensifying nationalism, declining political engagement and participation, and higher political polarization (Solt 2011, 2012, and 2015; Boix 2003; Acemoglu and Robinson 2005). Recent studies also connect it to the growing popularity of radical and anti-establishment political parties and the intensifying backlash against European and global integration in the OECD area (Han 2016; Burgoon 2012). Understanding the main causes of inequality is thus hugely important because policymakers will have difficulties formulating effective policies to combat it unless they understand the factors that drive income differentials.

This paper is structured as follows. The next section briefly overviews existing scholarship on the causes of income inequality, with a special focus on research pertaining to Latin America and Central and Eastern Europe. I then proceed to develop an argument discussing the impact of deindustrialization and the rise of the service sector on the income distribution. I posit that while the expansion of services has exacerbated income differentials in both regions, deindustrialization has increased inequality in Eastern Europe and decreased income dispersion in Latin America. To test this argument, I employ a cross-sectional time-series analysis of ten Central and Eastern European countries and twenty-one Latin American countries between 1991 and 2012. The results support my expectations. The fifth section includes a number of robustness checks demonstrating that my results are not susceptible to changes in modeling techniques and model specification. I conclude with a discussion of the implications my findings have for further

research.

2.2 Existing knowledge

The literature on income inequality has focused on a variety of factors that influence the evolution of income dispersion. While some models highlight the impact of economic processes and international dynamics, others emphasize the importance of domestic institutions and political actors. Existing scholarship on the less developed world draws on both traditions and acknowledges the importance of both sets of factors.

One of the earliest theories about inequality links changes in the distribution of income to transformations in economic structure (Kuznets 1955; Nielsen and Alderson 1995). Industrialization initially results in higher levels of income dispersion since the incipient manufacturing sector is more productive than traditional agriculture. As economies continue to modernize and industry attracts a higher proportion of the labor force, however, sector dualism and inequality decrease. Because employees typically have similar productivity levels and unions have historically fought for wage compression, wage dispersion tends to be lower in manufacturing. Logically, then, deindustrialization has been associated with rising inequality (Milanovic 1999; Thewissen et al. 2013; Thewissen and Vliet 2014, Orenstein 2008; Bohle and Greskovits 2007 and 2012; Bogliaccini 2013; Kollmeyer 2013 and 2015). As employment becomes concentrated in more heterogeneous sectors, where productivity and remuneration vary considerably, the employment structure becomes more polarized. This polarization is exacerbated by the destruction of high-wage employment opportunities for low-skilled workers, which industry has traditionally provided (Rodrik 2011 and 2015). The transition to a service-based economy has thus contributed to income inequality by decreasing the weight of the more homogeneous manufacturing sector.

The switch toward a more liberal economic model beginning in the 1980s has produced similar outcomes. Neoliberalism entailed the elimination of state involvement in economic matters and the privatization of previously state-owned companies. These processes significantly altered the distribution of income both in the OECD area (Huber and

Stephens 2001) and in the less developed world (Orenstein 2008; Ivanova 2007; Huber and Solt 2004; Izyumov and Claxon 2008; Bogliaccini 2007). The removal of price controls and the resulting rise in utility prices hurt the poor while benefiting the rich, who gained ownership of many utility companies after the reforms (Haggard and Kaufman 2008; Kaufman and Nelson 2004). The sale of public enterprises also resulted in considerable unemployment and wage dispersion (Milanovic 1999; Milanovic and Ersado 2008; Ivaschenko 2002; Keane and Prasad 2002; Birdsall and Nellis 2002; Gerry and Mickiewitz 2008). The decline of the generally more egalitarian public sector thus had important implications for inequality.

Trade and financial liberalization, which neoliberalism actively promoted, have also sparked interest in the relationship between globalization and income inequality (OECD 1994; Autor et al. 2016, Kollmeyer 2009, 2013, and 2015; Bourguignon 2015; Thewissen 2014; Mahutga and Bandelj 2008). Recent decades have witnessed intensified capital and commercial flows and heightened competition in international markets (Garrett 1998; Mosley 2003; Rodrik 1990; Rudra 2002). The traditional Heckscher-Ohlin model¹ predicts that free trade would result in specialization favoring each country's abundant factor of production (Krugman and Obstfeld 2010). Opening up to foreign commerce supposedly raises the relative return of labor and benefits low-skill workers in less-developed countries (Kanbur 2015). This model, however, has received mixed empirical support (Meschi and Vivarelli 2007; Feenstra 2008; Goldberg and Pavcnik 2007). Indeed, research on Latin America and Central and Eastern Europe highlights that trade liberalization worsened the income distribution in these regions (Feenstra and Hanson 1996; Revenga and Montenegro 1995; Bogliaccini 2013; Alarcon and McKinley 1995; Mitra and Yemtsov 2006). In many cases, this rise was due to increases in the educational premium (Wood 1995; Lustig 2010). Because specialization entails technology transfers and enhances the skill intensity of production, the wage gap between skilled and unskilled labor widened (Feenstra and Hanson 1997; Kanbur 2015; Bourguignon 2015). Furthermore, competition with

¹The Heckscher-Ohlin model is an economic model which discusses how opening up to international trade will affect the different sectors of the economy.

low-income economies expands the supply of unskilled workers worldwide and threatens employment in higher-wage middle-income states (Kanbur 2015).

The specific consequences of these changes for the income distribution, however, also depend on political institutions. Institutional arrangements affect the feasibility of reforms and shape relations between capital and labor. The presence of multiple veto players, for example, may create a status quo bias that prevents radical departures from an equilibrium benefiting high-income groups (Enns et al. 2014). Other policy equilibria are more favorable to labor. Corporatism, for instance, promotes coordination that aims to ensure enduring competitiveness, stable employment, and suppressed income differentials (Hall and Soskice 2001; Van Kersbergen and Vis 2013). Furthermore, the mobilization of workers into trade unions improves their bargaining position relative to capital, generates wage compression, and helps maintain relatively high wages in the industrial sector (Wallerstein 1999; Moller et al. 2003; Kelly 2009). The noticeable decline of trade unions during the neoliberal period in Latin America and Central and Eastern Europe was thus linked to increases in inequality in these two regions (Roberts 2013). In contrast, Slovenia's ability to maintain a relatively egalitarian income distribution has been attributed to its wage bargaining institutions (Bohle and Greskovits 2007 and 2012).

The success of these institutions has often depended on regime type. According to existing research, political competition makes ruling elites responsive to the interests of a larger constituency and facilitates the formulation of demands for higher redistribution and greater participation in policy-making (Bueno de Mesquita 2003; Grzymala-Busse 2002; Vachudova 2005; Hellman 1997). Electoral pressures also force local officials to practice forbearance, which generates income and employment for low-income constituents (Holland 2015 and 2017). The dispersion of political power, however, does not necessarily translate into inequality-alleviating pacts. International competition can limit democratic governments' ability to enhance workers' bargaining power (Choi 2017). Furthermore, since the lower classes are frequently unable to overcome collective action problems (Keefer 2007; Huber and Stephens 2012) and often lack the political capital to hold elites accountable (Ross 2006), democracies that do not have the institutions to

enable poorer citizens to mobilize and meaningfully affect policy-making may perpetuate pre-existing socio-economic hierarchies.

This is the point of departure of power resource theory (PRT), which highlights the organizational strength of political actors and views the fight over redistribution as a struggle between social actors with opposing interests (Huber and Stephens 2001; Hicks 1999). According to this analytical framework, where labor unions and left-wing parties are strong, the political agenda, either pre- or post-taxes-and-transfers, is more egalitarian (Hicks 2000; Huber and Stephens 2001; Bradley et al. 2003; Iversen and Soskice 2006). Apart from collaborating with unions, left-leaning parties also engage in market conditioning and expand social investment (Kelly 2004, 2009; Morgan and Kelly 2013). While PRT has found empirical support in Latin America, Western Europe, and the United States (OECD 2008 and 2011; Huber and Stephens 2012 and 2015; Esping-Andersen 1990; Volscho and Kelly 2012; Madrid et al. 2010; Levitsky and Roberts 2011; Segura-Ubierga 2007), it has been more controversial in Central and Eastern Europe, where the literature's focus has frequently been on constraints and internal partisan dynamics (Tavits and Letki 2009).

Research on economic inequality has thus identified a variety of factors that shape the evolution of income distribution. Nevertheless, recent work has neglected the impact of structural dynamics and has provided only a partial explanation of the consequences of economic reorganization in Latin America and Eastern Europe. Furthermore, existing scholarship has so far not engaged in a comparison between these two regions, which can shed light on the precise dynamics and consequences of this reorganization process and illuminate the differential impact that deindustrialization has had in the global periphery. This study seeks to fill this gap by conducting the first systematic comparison of Latin America and Eastern Europe and by examining how integration into the global economy influences income dispersion.

2.3 Theoretical Framework

As previously noted, the crisis of the interventionist development models adopted in Latin America and Central and Eastern Europe in the mid-twentieth century brought about substantial economic reorganization. Facing skyrocketing inflation, considerable credit constraints, and deteriorating economic conditions, countries in the two regions had to dramatically restructure their economies. Throughout the 1980s and the 1990s, governments across Latin America and Central and Eastern Europe liberalized trade, privatized previously state-owned enterprises, lifted price controls, eliminated subsidies, relaxed the regulatory framework, and allowed capital mobility (Williamson 1990). Although each state approached the reform process differently, they all adhered to the same guidelines and pursued similar policies.

The removal of state subsidies and trade barriers accelerated the decline of the manufacturing sector in both regions. Because local manufacturing had enjoyed high state protection under communism and import-substitution industrialization, it had grown uncompetitive and obsolete (O'Donnell 1973, Pop-Eleches 2009, Sznajder Lee 2016, Bohle and Greskovits 2012). Domestic enterprises lacked sufficient capital to invest in innovation, develop optimizing production methods, or purchase new technology. Once exposed to competition from more technologically advanced or lower wage countries, these enterprises were unable to withstand international competition. As a result, domestic industry collapsed. In some cases, asset-stripping by predatory domestic elites contributed to this process (Ganev 2007). In Bulgaria, for example, groups related to the former communist party stifled domestic production by expropriating modern technology and domestic capital, and by positioning themselves at the entrance and the exit of successful industrial enterprises to profit from their economic activity.

In the course of the 1990s, therefore, the relative weight of the tertiary sector in the economy increased noticeably in both regions. The disappearance of industrial enterprises left millions of workers jobless. The rapidly shrinking number of surviving manufacturing firms could not accommodate this surplus labor. Furthermore, these workers' skills were not easily transferable, so few of them could switch from one industry to another.

Consequently, they were either confined to unemployment or had to seek opportunities in other sectors. Services often provided such opportunities and absorbed the flow of labor that was leaving industry.

The expansion of the service sector is generally associated with an increase in market income inequality. Services are typically characterized by their heterogeneity. Some occupations, such as ones in finance, information technology (IT), and telecommunications, demand high qualifications, technical expertise, and/or specific education. Others, such as the ones in retail or hotels and restaurants, do not require special training. Consequently, high-skill professions coexist with low-skill occupations. Productivity levels differ widely across these jobs and, as a result, wage dispersion tends to be high. Since highly specialized workers are more difficult to replace, they earn competitive salaries, enjoy relatively high job security, and receive generous benefits. In contrast, low-skill workers often lack job security, income stability, and access to benefits. The expansion of the service sector is therefore likely to result in the polarization of the employment structure between high-paid highly specialized professionals and poorly remunerated service positions.

While institutional arrangements can mitigate this polarization, such institutions are less likely to emerge in the service sector. Most notably, labor unions, which have historically fought to increase wages, reduce income differentials, promote labor rights, and extend benefits to all workers in a given sector, rarely form in services. The significant diversity of this sector often means that workers have different interests and favor different policies. Reforms that help some can hurt others. As a result, it is difficult for service sector workers to unite behind a common agenda and mobilize in representative sector-wide organizations. However, the absence of such unions prevents the pursuit of policies that can ameliorate income differentials.

Lastly, services tend to be geographically dispersed, which further contributes to wage dispersion within the sector. Research on economic inequality has identified spatial dynamics as playing an important role in shaping overall income distribution. Economic growth and dynamism vary across the territory of the state. While some areas, such as

the capital and other major urban centers, grow rapidly and offer diverse employment opportunities, others, such as smaller towns and rural communities, frequently stagnate. Consequently, wages exhibit high geographic variation. This variation is not so present in manufacturing, where unions generally harmonize pay levels, but services do not provide a mechanism for coping with regional differences. The service sector, then, contributes to income inequality through both its heterogeneity and its spatial dispersion. As a result, its expansion was associated with an increase in inequality in both Latin America and Central and Eastern Europe.

In contrast, I argue that dynamics within the industrial sector have had different repercussions on income distribution in the two regions. In the post-communist world, deindustrialization widened income differentials because it raised unemployment rates and reduced the employment opportunities available to low-skill workers. Industrial jobs typically offer higher pay even to low-skill workers because labor's average productivity tends to be higher in manufacturing. Furthermore, productivity differences are lower in this sector, so pay levels tend to be more homogeneous. Labor unions, which often form in manufacturing, have also contributed to maintain this homogeneity. Industry has thus served as an equalizing force in Central and Eastern Europe.

Although subsequent developments within the sector have altered its profile, they have not erased this equalizing effect. After the fall of the Berlin Wall in 1989, Central and Eastern European countries received substantial foreign direct investment flows from advanced industrialized economies. Their lower wages, geographic proximity, and educated labor force proved attractive to Western European producers searching for lower costs and convenient locations. As a result, many Western enterprises off-shored production and relocated to their Eastern neighbors (Dauth et al. 2014). Central and Eastern European countries thus rapidly integrated into global supply chains and production networks (Marin 2010 and 2017). Joining the structures of the international economy therefore partly counteracted the effect of the loss of markets and subsidies and decelerated deindustrialization following by the collapse of communism in the region (Bohle and Greskovitz 2015).

Consequently, industry continues to provide employment opportunities in the region. These newly generated jobs vary in the skills that they demand. Some target low-skill workers, whose cheap labor can bring down production costs and grant a competitive advantage to otherwise expensive European producers. This is the case with the sewing factories in south-western Bulgaria. Others, like the jobs on assembly lines in the Czech Republic and Poland, as well as in the industrial parks in Bulgaria and Romania, require significant technical skills. Because the region generally boasts high levels of education, however, this division has not greatly exacerbated the educational premium. Manufacturing thus continues to act as an equalizing force, and higher levels of employment in this sector are associated with lower levels of economic inequality.

In contrast, Latin America has experienced a different trend. Although the adoption of import substitution industrialization absorbed low-skill labor, once trade liberalization occurred, the manufacturing sector modernized and updated its production methods. Many of the labor-intensive industries declined, forcing millions into joblessness. Simultaneously, the mining and resource extraction sector, which is highly dependent on modern technology and employs few workers in the production stages, expanded following the remarkable rise in commodity prices in the early 2000s. As a result, the Latin American industrial sector has become more capital-intensive in recent years. It seeks and employs educated and, on occasions, highly specialized, workers, which have historically been relatively scarce in the region. Although this trend reversed in the 2000s and educational coverage rose significantly, access to education has traditionally been limited and the skill premium has been high in the area. Throughout the 1990s and the 2000s, then, industrial jobs were relatively few and significantly better paid than other sources of employment. Contrary to its effect in Central and Eastern Europe, the expansion of the manufacturing sector in Latin America should therefore be related to higher income inequality.

In sum,

- *Hypothesis 1: The expansion of the service sector in Latin America and Central and Eastern Europe is associated with higher market income inequality.*

- *Hypothesis 2: A larger industrial sector is associated with lower market income inequality in Eastern Europe.*
- *Hypothesis 3: A larger industrial sector is associated with higher market income inequality in Latin America.*

In this sense, I argue that economic reorientation had important implications for the evolution of inequality in Latin America and Central and Eastern Europe. A country's economic structure shapes the demand for labor, the return to skills and education, and the relative profitability of different sectors. This structure is thus likely to strongly affect the distribution of market income.

2.4 Empirical Analysis

To evaluate this argument, I employ a cross-sectional time-series analysis of 31 Latin American and Central and Eastern European countries. This geographical scope covers Continental South America, Central America, Central Europe, and South-Eastern Europe. States in these regions have traditionally occupied a peripheral position in the global economic system (Bollen 1983; Dunn et al. 2000; Oatley et al. 2013; Snyder and Kick 1979). Their economic development has often been characterized as strongly dependent on international business and commodity cycles (Campello 2015; Cardoso and Faletto 1970; Frank 1969; Prebisch 1950), while their growth and macroeconomic stability have been tied to the performance of economically more advanced and influential neighbors (Bohle and Greskovits 2012, Campello 2014). Recognizing the different dynamics in these two regions, statistical models separate the 21 Latin American² countries from the 10 Eastern European states.³

The analysis for all countries starts in the early 1990s. At that point, most of them

²Bolivia, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. Several small Central American states drop out of the analysis due to data availability issues.

³Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

had initiated the process of economic restructuring and integration into the global system of production. They had adopted and begun to implement neoliberal reforms, opening their economies to trade and capital flows. Because the first years of this process were exceptionally turbulent, domestic statistical offices often faced considerable challenges related to data collection. Consequently, missingness forces me to exclude some of these initial years from my analysis. Central and Eastern Europe, then, enter the models in 1994 and 1995, roughly five years after the collapse of Communism in the region. This period was unique and highly unusual in the region's history in that it witnessed these countries' attempts to create a private sector and completely rebuild their economies. Starting the analysis in 1995 thus helps to ensure that this exceptional period in the history of the region does not drive or bias my results.⁴ In the case of Latin America, I exclude the 1980s and limit the statistical analysis to the 1990s and the 2000s. This is because the so-called Lost Decade witnessed a severe economic crisis that similarly transformed the economic and political trajectory of the continent. Furthermore, data for this period are characterized by substantial missingness, producing an interrupted time series. The endpoint for all countries is 2012.

The dependent variable, the pre-tax-and-transfer GINI coefficient, reflects the level of market inequality in a given year. A measure of statistical dispersion, the market GINI index captures the overall disparity characterizing the income distribution of a nation's residents before redistribution. Although other measures of economic inequality provide information about the income shares of specific subsections of the population, the focus of this paper on structural transformations affecting the entire employment structure justifies the use of an overall measure that reveals changes in the society-wide distribution of income. Furthermore, since my argument highlights the impact of sectoral economic processes, I choose to ignore the role of government intervention through transfers and taxes at this stage of the analysis. Data are available through the Standardized World Income Inequality Database (SWIID), which homogenizes and standardizes data from

⁴Lack of data for the late 1980s makes multiple imputation inappropriate because I do not have any previous values that I can use to impute or interpolate missing data points.

various sources⁵ to enable cross-country comparability (Solt 2014). The SWIID is currently the most extensive dataset on inequality in terms of its geographical and temporal coverage, providing comparable observations for all of the countries in my sample⁶.

As illustrated by Figures 1 and 2, market inequality exhibits substantial variation over the period under examination. Market-generated income disparities are relatively low in the post-Communist world around 1990. This low starting point reflects the equalizing influence of the socialist economic model, which suppressed income differentials and artificially homogenized remuneration levels across occupations of different productivity and skill levels. Obvious exceptions to this trend are Poland and Hungary, where economic reforms began in the late 1980s and which had attained a degree of market liberalization by the time Communism collapsed. Market inequality increased throughout the region over the course of the 1990s. In some cases, this rise was steep and concentrated during the first years of the transition, with income inequality stabilizing around the late 1990s or the mid-2000s. In others, it was more gradual and persistent, continuing throughout the first twenty-five years of the transition. The early 2010s witnessed considerable diversity in market inequality levels: while some Eastern European states, such as Bulgaria, Slovenia, and Romania, had succeeded in keeping differentials relatively low, others, such as the Baltic States, experienced much higher dispersion.

The Latin American context reveals similar variation. Starting levels of market income inequality in the region are diverse, but they tend to be substantially higher than in the post-Communist world, often exceeding 0.50. Inequality began rising during the 1980s and continued increasing throughout the 1990s in most of continental Latin America. Some Central American states, such as Guatemala, Nicaragua, and El Salvador, experienced a decline during the early 1990s, but they faced a reversal of this trend around 1995. The mid-2000s, which witnessed the outset of the global commodity boom, bought

⁵Such as the Luxembourg Income Survey (LIS) and the World Institute for Development Economics Research at the United Nations University.

⁶The fifth version of the dataset contains 100 separate time-series imputations for each state to account for uncertainty. Following the standard practice recommended by Solt, the dependent variable used here is the mean of the 100 imputed series. To check the robustness of my findings, I also carry out the analysis with the median, minimum, and maximum of these 100 imputed series.

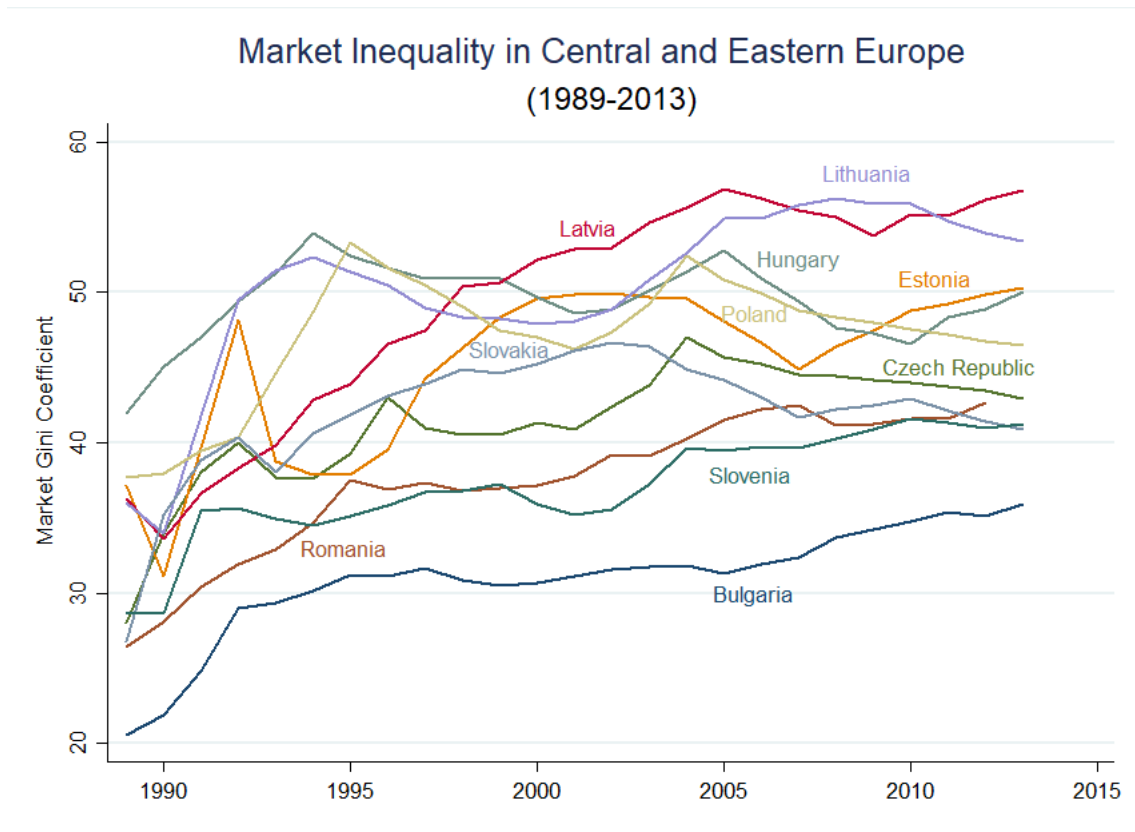


Figure 2.1: Market Income Inequality in Central and Eastern Europe (1990-2013)

about a substantial decrease in market inequality throughout the area. In some cases, this fall exceeded 0.10; in others, it was much more limited in size. The most recent data from the 2010s indicate a small increase in market inequality in a number of countries.

The main independent variables capture trends in industrial and service sector employment. Expressed as a percent of the working age population in a given year, the two variables reflect the relative size of these sectors in the economy in terms of their ability to absorb labor. Since the argument above highlights dynamics within the employment structure, this measure is better suited to testing my hypotheses than alternative operationalizations that reveal the value added of these sectors. The industrial sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water), and it covers divisions 2-5 in the International Standard Industrial Classification 2 (ISIC). Services encompass wholesale and retail trade, transportation, accommodation and food, businesses and administrative services, public administration, and community, social, and other services and activities in accordance with divisions 6-9.

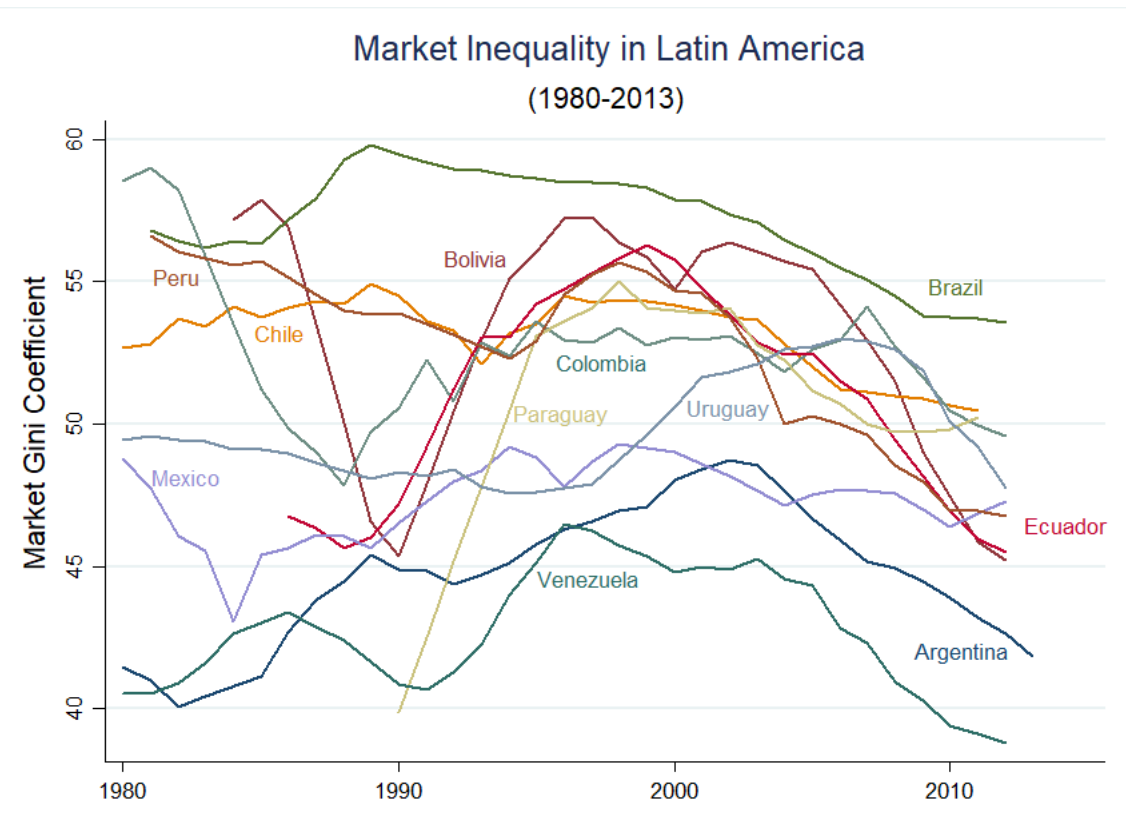


Figure 2.2: Market Income Inequality in Latin America (1980-2013)

Data come from the International Labor Organization's Statistical Database, which offers the most complete coverage for the period between 1991 and 2012.⁷

A set of variables accounts for the effect of alternative explanations. Logged GDP per capita, inflation, GDP growth, employment levels as percent of the total labor force, and unemployment rates reflect changing economic conditions. Trade openness, foreign direct investment flows, and capital account liberalization capture the impact of globalization. Rural population measures the urban-rural divide. Natural resource rents reflect reliance on natural resources. Since the public sector might alleviate market income inequality by absorbing labor, suppressing income differentials, or influencing the supply and demand for goods and services, I add government final consumption. Because countries in both regions experienced substantial emigration, I include remittances as a share of GDP to

⁷The ILO uses data reported by national statistical offices. In cases of missingness, it resorts to multiple imputation to fill in missing values. The specific multiple imputation approach relies on interpolation when lags and leads are available. It also draws information from other variables, such as a country's GDP per capita levels.

account for the additional income that citizens living abroad send home. I also control for the level of human capital in each economy. Lastly, consistent with existing scholarship on regime type and partisan ideology, I include V-Dem's electoral democracy index and a control for left parties' share in national legislatures. A dummy variable accounts for the period of rising commodity prices between 2003 and 2012.

Cross-sectional time-series analysis presents several substantial challenges that make the standard application of Ordinary Least Square (OLS) regression inappropriate (Hicks 1994). A fundamental assumption of OLS is that disturbances are independent from each other. In panel data, however, observations are linked in highly structured ways. Thus, pooled data produce temporally autoregressive and cross-sectionally correlated error terms, which result in biased and inconsistent parameter estimates (Hicks 1994; Huber, Huo, and Stephens 2017). To address this problem, I estimate fixed effects models with Driscoll-Kraay standard errors. Fixed effects models essentially absorb cross-sectional variation by introducing country dummies. They control for all time-invariant differences between cases, while simultaneously allowing unobserved country-characteristics to freely correlate with time-varying covariates (Bollen and Brand 2010). Fixed effects models thus focus on the temporal variation within panels. This makes them particularly appropriate for the study of the causes of change over time. Furthermore, Driscoll-Kraay standard errors (DSKES) correct for spatial dependence (Driscoll and Kraay 1998). An alternative to traditionally used panel corrected standard errors, DKSEs are heteroscedasticity-consistent and perform better when the number of panels exceeds the number of temporal observations (Hoechle 2007). My model specification and estimation technique are therefore conservative, ensuring that I am subjecting my argument to a particularly difficult test.

2.5 Results

Tables 1 and 2 below present the results from the statistical analysis. Models 1 through 5 examine the impact of a country's employment structure on its market income GINI coefficient in Central and Eastern Europe. In contrast, models 6 through 10 limit the

sample to Latin America. Models 1 and 6 run baseline specifications that exclude my main independent variables of interest. Models 2 and 7 add employment in industry. Models 3 and 8 focus on the service sector. Models 4 and 9 then include both employment share variables. Lastly, models 5 and 10 replace the main independent variables with the ratio of employment levels in industry and services, which captures changing dynamics within both of these sectors. The R2 values yielded by the regressions indicate that accounting for structural transformations improves model fit. In all of these cases, the addition of the employment structure variables increases the explanatory power of the models by 4 to 7 percentage points.

The measures of sectoral employment shares return statistically significant coefficients across all models. Their signs are consistent with the theoretical expectations developed above⁸. Holding the effect of all other variables constant, a larger industrial sector is associated with lower market income GINI coefficient in Central and Eastern Europe. This result is consistent with the literature on deindustrialization in the post-communist world. The collapse of industry destroyed many jobs and deprived many low-skill workers of employment opportunities. Although some of these workers found jobs in services, this sector was not homogenous. Its expansion is related to higher income dispersion, *ceteris paribus*. This result confirms the polarization hypothesis, suggesting that Central and Eastern Europe underwent transformations that were similar to the ones that occurred in their Western European neighbors. The joint inclusion of both employment share variables in the analysis does not substantially change this conclusion. The signs of the two coefficients remain the same. Service sector employment loses its statistical significance, but this might be because dynamics in industry are more important. The statistically significant ratio of both employment shares variables indicates that the transfer of more workers from the service to the industrial sector could alleviate market income inequality.

⁸To check whether this result is not influenced by model specification, I regressed market income inequality on industrial and service sector employment shares excluding all controls. The results did not change considerably.

Table 2.1: Employment structure and market income inequality in Central and Eastern Europe

	Model 1	Model 2	Model 3	Model 4	Model 5
	b/se	b/se	b/se	b/se	b/se
Industrial Employment		-0.526*** (0.13)		-0.388* (0.16)	
Services Employment			0.439** (0.12)	0.233 (0.17)	
Ind / Ser Employment					-14.987** (4.16)
Left Legislature	0.010** (0.00)	0.008* (0.00)	0.010* (0.00)	0.008* (0.00)	0.009* (0.00)
Democracy	-16.328** (5.47)	-17.397** (4.92)	-18.868*** (4.51)	-18.465** (4.95)	-19.627*** (4.19)
Capital Openness	-0.070 (0.31)	0.120 (0.29)	0.091 (0.32)	0.156 (0.30)	-0.084 (0.27)
Trade Openness	-0.014 (0.02)	-0.030 (0.02)	-0.029 (0.02)	-0.034* (0.02)	-0.025 (0.02)
FDI Inflows	-0.021 (0.02)	-0.001 (0.02)	-0.003 (0.02)	0.004 (0.02)	-0.011 (0.02)
Economic Growth	0.002 (0.03)	0.022 (0.03)	0.062* (0.04)	0.048 (0.03)	0.029 (0.03)
GDP per capita	12.107*** (1.88)	10.927*** (1.38)	4.036 (2.74)	6.948* (3.67)	8.094*** (1.62)
Inflation	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Unemployment	0.102 (0.10)	-0.102 (0.10)	0.020 (0.11)	-0.092 (0.09)	0.026 (0.11)
Employment Level	-0.207* (0.12)	-0.265* (0.13)	-0.013 (0.10)	-0.147 (0.10)	-0.061 (0.14)
Human Capital	-13.677*** (3.48)	-16.287*** (2.98)	-11.041** (3.57)	-14.198** (3.85)	-13.397*** (3.20)
Public Sector	-0.081 (0.05)	-0.202** (0.06)	-0.136* (0.05)	-0.199** (0.06)	-0.225*** (0.05)
Remittances	-10.016 (11.75)	4.271 (13.44)	-7.085 (12.75)	2.066 (15.15)	7.100 (13.53)
Rural Population	0.207 (0.20)	0.141 (0.14)	0.330* (0.15)	0.224 (0.13)	0.219 (0.14)
Natural Resource Rent	0.066 (0.42)	-0.057 (0.28)	-0.070 (0.37)	-0.096 (0.28)	0.115 (0.27)
Boom (2003-2012)	0.624 (0.59)	0.713 (0.57)	0.918 (0.57)	0.846 (0.61)	0.783 (0.54)
Constant	-12.154 (20.47)	36.854* (19.25)	24.944 (25.86)	43.664* (23.46)	34.484 (24.25)
R-squared	0.429	0.496	0.481	0.506	0.481
N	181	181	181	181	181

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 2.2: Employment structure and market income inequality in Latin America

	Model 6	Model 7	Model 8	Model 9	Model 10
	b/se	b/se	b/se	b/se	b/se
Industrial Employment		0.171*		0.066	
		(0.06)		(0.05)	
Services Employment			0.198***	0.180***	
			(0.03)	(0.03)	
Ind / Ser Employment					3.654
					(2.95)
Left Legislature	-2.478*	-2.364*	-1.864*	-1.877*	-2.453*
	(0.93)	(0.91)	(0.74)	(0.74)	(0.94)
Democracy	1.326	1.974	1.694	1.911	1.440
	(1.39)	(1.51)	(1.26)	(1.29)	(1.43)
Capital Openness	0.433*	0.432*	0.557**	0.545**	0.421*
	(0.21)	(0.22)	(0.18)	(0.18)	(0.21)
Trade Openness	-0.009	-0.008	-0.005	-0.005	-0.009
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
FDI Inflows	0.256***	0.243***	0.223***	0.221***	0.253***
	(0.06)	(0.06)	(0.05)	(0.05)	(0.06)
Economic Growth	-0.008	-0.019	0.000	-0.005	-0.012
	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
GDP per capita	-6.359*	-5.515**	-7.255**	-6.845**	-5.971**
	(2.30)	(1.84)	(2.35)	(2.16)	(2.10)
Inflation	0.001*	0.001*	0.002*	0.002*	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Unemployment	-0.035	0.000	-0.052	-0.037	-0.021
	(0.07)	(0.07)	(0.06)	(0.06)	(0.07)
Employment Level	-0.068*	-0.059	-0.004	-0.006	-0.071*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Human Capital	-1.617	-2.704	-2.627	-2.954	-1.942
	(2.47)	(2.77)	(2.54)	(2.64)	(2.58)
Public Sector	0.223**	0.286**	0.264**	0.284**	0.241**
	(0.06)	(0.08)	(0.07)	(0.08)	(0.07)
Remittances	3.942	4.650	2.854	3.230	5.082
	(5.79)	(6.36)	(5.97)	(6.18)	(5.80)
Rural Population	-0.110	-0.135*	-0.027	-0.045	-0.131*
	(0.07)	(0.05)	(0.08)	(0.08)	(0.07)
Natural Resource Rent	0.009	0.023	0.043	0.045	0.009
	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)
Boom (2003-2012)	-1.069	-0.986	-1.132*	-1.094*	-1.038
	(0.64)	(0.66)	(0.58)	(0.60)	(0.66)
Constant	116.940***	106.697***	107.689***	104.583***	113.258***
	(20.37)	(15.73)	(21.46)	(19.49)	(18.38)
R-squared	0.365	0.382	0.414	0.416	0.367
N	398	398	398	398	398

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

The structural dynamics at play in Latin America are slightly different. The growth of services there also leads to an increase in the GINI coefficient. Income differentials

increase as service sector employment levels rise. Nevertheless, a higher proportion of the labor force engaged in the industrial sector is not linked to lower inequality. The coefficient for industrial employment is positively signed, suggesting that the rise of industry has the potential to exacerbate market income dispersion. As previously noted, this might be because industry in Latin America is not labor-intensive and nowadays demands high skills, which are relatively scarce in the region. Model 9 suggests that when both sectors are included, the expansion of services is more important. Finally, the ratio between industrial and service sector employment fails to reach statistical significance. This is logical given that both variables affect the market income distribution in the same direction. Changes in the distribution of workers between these two sectors are thus not likely to substantially alter the income distribution.

Several other findings are worth noting. Surprisingly, few of the economic controls are consistently statistically significant in the Central and Eastern European regressions. Higher GDP per capita is related to a higher GINI coefficient. This implies that as countries get richer, their income distribution is likely to become more unequal. The region's history during the transition confirms this result. Economic recovery and subsequent growth coincided with rising wage dispersion. A larger rural population has a similar effect. Many rural communities stagnated after 1989 as collectivized agriculture was reformed. This could have led to a higher disparity between rural and urban centers. In contrast, a higher employment rate is related to lower income inequality. Similarly, higher levels of human capital are associated with a lower GINI index. An educated labor force generally implies more homogeneous productivity levels and a lower educational premium as a larger proportion of the population has access to education. This reduces the gap in remuneration between high and low-skill workers, suppressing income differentials.

The political dynamics revealed by the models deserve special attention. A larger public sector in Central and Eastern Europe has an equalizing effect in the region. The negative coefficient of government final consumption suggests that salaries in the public sector are homogeneous or that government spending on goods and services can counteract market forces to decrease income differentials. Lastly, the two explicitly political

variables in the regressions – democracy and partisan ideology – both return statistically significant coefficients. The consolidation of democracy in Central and Eastern Europe, as captured by V-Dem’s electoral democracy index, is associated with a more egalitarian income distribution. This might be partly explained by temporal forces since inequality levels ceased their steep increase in the second half of the 1990s, when the political transition away from totalitarianism had concluded. Or it might be because, once established, democratic governments actively strove to ameliorate income differentials. This response, however, does not appear to have come from left-wing parties. The share of legislative seats occupied by leftist parties is actually positively correlated with the GINI coefficient. This result suggests that leftist parties oversaw rising inequality and could not condition markets to produce a more equitable distribution of income. My findings are therefore consistent with Tavits and Letki’s work, which shows that the Left in the region frequently adhered to macroeconomic orthodoxy and was forced to implement market-oriented reforms during the transition period (2002).

The political story is very different in Latin America. In this context, higher legislative control by left-wing parties is associated with lower market income inequality. This finding confirms the story developed by Huber and Stephens (2012) and Morgan and Kelly (2013), who argue that the Left in the region acted consistently with its historic commitment to greater equality not only by expanding social programs and redistributing income, but also by conditioning markets in a more equitable direction. This action appears to have counteracted the broader impact of the public sector. Indeed, government final consumption in Latin America exacerbates market income inequality. This might be because public sector employees in the region typically enjoy higher income, benefits and protection levels than other workers. The expansion of this sector therefore generates greater heterogeneity. Thus, the Latin American context strongly differs from the Eastern European one in political terms.

Economic factors also seem to shape the market income distribution differently in the two regions. Whereas economic development over time was associated with higher income dispersion in the post-communist world, in Latin America, it is related to falling

inequality. This might be partly because employment levels have stabilized over the last two decades. While the severe economic crises of the 1980s and the 1990s left millions jobless, the 2000s witnessed more people finding employment. Although in many cases these jobs were precarious and affected by business cycle dynamics, they did expand citizens' income, ultimately mitigating income differentials. Furthermore, and unexpectedly, a larger rural sector results in lower market income inequality, suggesting that income differentials outside of urban centers are lower. Inflation, on the other hand, has tended to exacerbate inequality. In many cases this can be explained with the rise of utility prices, which have disproportionately hurt the poor while benefiting top earners, who gained ownership of utility companies in the 1980s and the 1990s.

Finally, of particular note are the coefficients attached to capital account openness and foreign direct investment in the region. Existing scholarship on Latin America has highlighted that foreign capital has historically flown to capital-intensive sectors (Huber et al. 2006, Huber and Stephens 2012). More recently, tourism and other services have also attracted substantial resources. Recent studies reveal that, although variation among countries remains notable, foreign direct investment is increasingly concentrated in high-technology sectors (CEPAL 2015). With regard to capital mobility, the literature has argued that it has the potential to increase income inequality. Thus, foreign capital is expected exacerbate income differentials. The coefficients for both capital account liberalization and foreign direct investment flows support this prediction.

2.6 Robustness Checks

I ran a variety of tests to evaluate the robustness of these findings. As a first step, I further explored the impact of industry in Latin America by running an interaction term with secondary educational enrolment. Furthermore, I chose a more conservative modeling strategy by estimating Prais-Winsten regressions with country fixed effects. I proceeded to replace industrial employment shares with two measures of trade specialization in the production of manufacturing goods. Lastly, to further account for temporal dynamics, I de-trended my market income inequality and industrial and service-sector employment

series and re-estimated my models with the residuals.

2.6.1 Industry in Latin America

To further explore the impact of industry on the income distribution in Latin America, I plotted industrial employment against the value added by the industrial sector⁹. The comparison between these two series enables us to examine the relative labor-intensiveness of industry. If the value added of the sector is much higher than the proportion of the labor force engaged in it, we have reasons to believe that industry absorbs less labor and is more capital-intensive. Figure 3 below shows these proportions for all Latin American countries in my analysis. As it becomes clear, industrial value added exceeds industrial employment in many of the countries in the region. Although in some Central American states - such as Belize, El Salvador, Panama, and Nicaragua - the difference between the two proportions is very small, in others, it is quite noticeable. This implies that industry is more capital-intensive in the latter group. For comparison purposes, the same figure including all states in Central and Eastern Europe is included in Appendix 1.

What are the implications of this for income inequality? To assess that question further, I reran model 7 including an interaction term between industrial employment and gross secondary school enrolment. The plot suggests that the inequality-exacerbating effect of industry decreases as proportion of students enrolled in secondary education institutions increases. The interaction term is not statistically significant over the entire range of the enrolment ratio, but, crucially, it reaches statistical significance in the middle ranges. This implies that raising enrollment further once a majority of students already attend high school does not have the same return. The dynamics illustrated by graph 4 thus lend some support to the idea that industry increases income differentials because the sector employs high-skill workers who are not abundant in Latin American countries.

⁹Value added is expressed as a percent of national GDP.

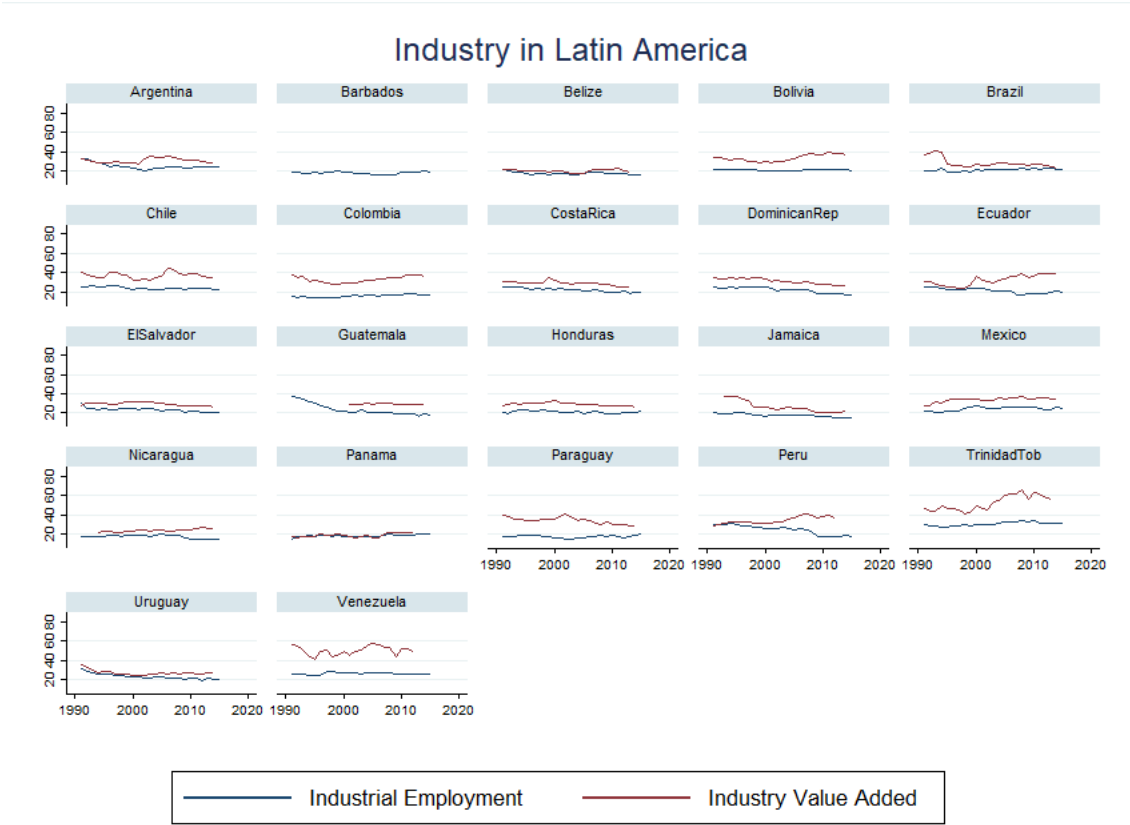


Figure 2.3: Industrial Employment and Industrial Value Added in Latin America

2.6.2 Prais Winsten Regressions with Country Fixed Effects

Prais-Winsten regressions, which combine panel-corrected standard errors with ar1 corrections, are substantively designed to address the serial and spatial autocorrelation that characterize cross-sectional time-series data (Beck and Katz 2004 and 2011). This empirical strategy generally accounts for both temporal and cross-sectional variation. Simultaneously, it effectively corrects for first order autoregressiveness by including a lagged dependent variable on the right hand side of the regression equation without suppressing the explanatory power of other covariates. It also assumes that disturbances are heteroskedastic across panels. To minimize the likelihood of omitted variable bias, I follow Beck and Katz and add country dummies. My modeling technique is thus exceptionally conservative.

Table 3 below re-runs models 2 and 3, which focus on Central and Eastern Europe, and 7 and 8, which explore trends in Latin America. My main results remain substantively

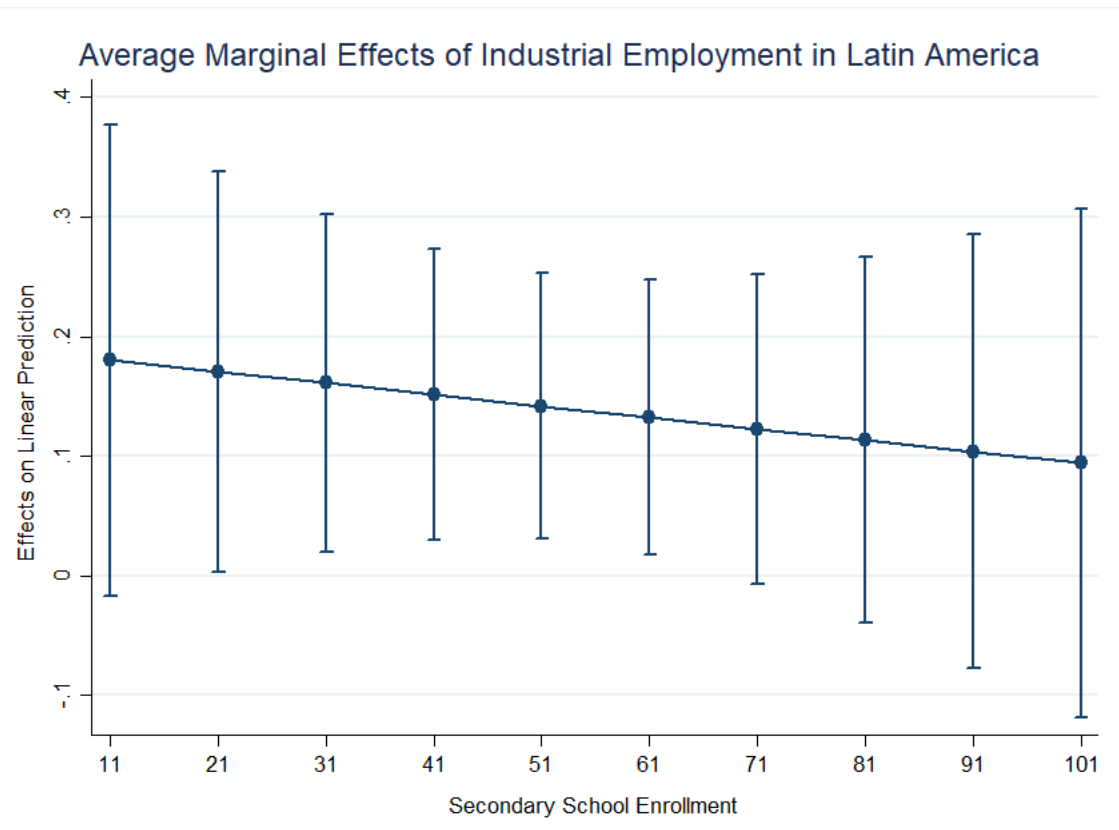


Figure 2.4: Interaction between industrial employment and secondary education (Latin America)

unchanged. The growth of the service sector is associated with higher market income inequality in both regions, holding the effect of other variables constant. In contrast, expanding industrial employment is correlated with lower income dispersion in Central and Eastern Europe. A higher proportion of the labor force in industry, however, has the opposite effect in Latin America, where it is related to a higher market income GINI coefficient.

Table 2.3: Employment structure and market income inequality in Eastern Europe and Latin America (Prais Winsten Regressions)

	CEE Ind	CEE Ser	LA Ind	LA Ser
	b/se	b/se	b/se	b/se
Industrial Employment	-0.297** (0.11)		0.132** (0.04)	
Services Employment		0.277** (0.10)		0.108*** (0.03)
Left Legislature	0.003 (0.00)	0.003 (0.00)	-0.982 (0.65)	-0.954 (0.64)
Democracy	-7.339 (5.05)	-6.866 (4.98)	3.758** (1.55)	3.743** (1.55)
Capital Openness	0.128 (0.18)	0.104 (0.18)	0.370** (0.13)	0.396** (0.13)
Trade Openness	-0.022* (0.01)	-0.023* (0.01)	-0.004 (0.01)	-0.003 (0.01)
FDI Inflows	0.001 (0.03)	0.007 (0.03)	0.067* (0.03)	0.071* (0.04)
Economic Growth	0.009 (0.03)	0.033 (0.03)	-0.007 (0.02)	-0.002 (0.02)
GDP per capita	10.396*** (1.94)	5.983* (2.59)	-4.292* (1.92)	-5.204** (1.88)
Inflation	0.001 (0.00)	0.001* (0.00)	0.000 (0.00)	0.000* (0.00)
Unemployment	0.022 (0.09)	0.079 (0.08)	0.033 (0.06)	0.005 (0.06)
Employment Level	-0.131 (0.09)	0.031 (0.09)	-0.046 (0.05)	-0.020 (0.05)
Human Capital	-12.227** (4.12)	-8.370* (4.00)	-2.940 (2.10)	-2.797 (1.97)
Public Sector	-0.044 (0.08)	0.003 (0.07)	0.082 (0.06)	0.068 (0.05)
Remittances	6.232 (12.05)	-1.348 (11.65)	18.954* (9.50)	16.589* (9.31)
Rural Population	0.169 (0.20)	0.244 (0.19)	-0.107 (0.07)	-0.039 (0.08)
Natural Resource Rent	0.110 (0.27)	0.075 (0.28)	-0.011 (0.04)	-0.014 (0.04)
Boom (2003-2012)	0.470 (0.36)	0.532 (0.37)	-0.767* (0.44)	-0.775* (0.42)
R-squared	0.941	0.941	0.950	0.949
N	181	181	398	398

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

The rest of the covariates behave similarly as in my original models, with a couple of exceptions. Trade is negatively signed and statistically significant in the Central and Eastern European models, suggesting that countries that trade more have lower income

differentials. In Latin America, higher remittances are related to higher income inequality. This might be because remittances generally constitute a higher percentage of national income in more unequal countries.

My results are therefore robust to the use of an alternative modeling technique. Similar to fixed effects models with Driscoll-Kraay standard errors, Prais Winsten regressions with country fixed effects are very conservative and account for the temporal and spatial dependencies in my data. Given the relatively small sample size, the fact that both empirical strategies lead to the same conclusions lends additional support for my hypotheses.

2.6.3 Trade Specialization Models

Although consistent with existing scholarship on Eastern Europe and Latin America, the relationship between industrial employment and market income inequality merits additional analysis. To further explore the impact of industry on the income distribution in both regions, I replace my main independent variable with two measures of trade specialization in manufacturing goods. The United Nation Conference on Trade and Development's *tsiman* is an index which reflects the normalized trade balance at the level of manufacturing goods. It is calculated by dividing the net flows of manufacturing goods (exports minus imports) by the total flow of goods (total exports minus imports). Higher values of the index thus imply greater specialization in the production of industrial goods while lower values indicate higher dependence on imports from the rest of the world. *Manufacturedgdp*, on the other hand, captures the amount of manufacturing exports as a fraction of a country's GDP.

Table 2.4: Manufacturing specialization and market income inequality in Eastern Europe and Latin America

	CEE Special b/se	LA Special b/se	CEE Manufactured b/se	LA Manufactured b/se
Tsiman	-8.215* (4.07)	2.877*** (0.68)		
Manufacturedgdp			-11.602* (5.14)	2.861 (2.18)
Left Legislature	0.011** (0.00)	-3.191* (1.40)	0.009* (0.00)	-3.396* (1.38)
Democracy	-30.407*** (5.55)	0.263 (2.50)	-21.667** (5.90)	0.575 (2.47)
Capital Openness	-0.402 (0.27)	0.251 (0.17)	0.037 (0.41)	0.255 (0.18)
Trade Openness	-0.028 (0.02)	-0.023 (0.02)	0.004 (0.02)	-0.022 (0.02)
FDI Inflows	-0.043 (0.03)	0.191** (0.06)	-0.033* (0.02)	0.186** (0.06)
Economic Growth	-0.002 (0.04)	0.058 (0.04)	0.040 (0.03)	0.047 (0.04)
GDP per capita	6.664*** (1.61)	-3.903* (2.23)	6.705*** (1.60)	-4.420* (2.17)
Inflation	0.002*** (0.00)	0.024 (0.02)	0.001* (0.00)	0.028 (0.02)
Unemployment	0.102 (0.11)	0.027 (0.10)	0.063 (0.11)	0.017 (0.11)
Employment Level	-0.225* (0.13)	-0.077* (0.04)	-0.220 (0.14)	-0.080 (0.05)
Public Sector	-0.180* (0.09)	0.346*** (0.06)	-0.118* (0.07)	0.334*** (0.07)
Remittances	-18.302 (12.64)	-1.445 (5.02)	-5.072 (15.75)	-2.477 (5.00)
Rural Population	0.508* (0.24)	0.028 (0.10)	0.498* (0.24)	0.006 (0.10)
Natural Resource Rent	0.363 (0.28)	0.037 (0.05)	0.207 (0.38)	0.043 (0.05)
Boom (2003-2012)	1.899** (0.48)	-0.451 (0.59)	0.694 (0.50)	-0.359 (0.66)
Left Legislature				
Human Capital		-5.428** (1.61)		-5.498** (1.72)
Constant	1.323 (19.05)	100.531*** (20.42)	-5.758 (19.29)	104.720*** (20.61)
R-squared	0.462	0.505	0.439	0.492
N	173	331	179	331

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 4 above reproduces models 2 and 7, substituting the industrial employment

shares variables with the trade specialization in manufacturing goods index and the manufacturing exports measure. The only difference in the specification is due to the fact that the two UNCTAD measures are highly correlated with the human capital and the GDP per capita controls in the Eastern European regression. To avoid the issue of multicollinearity, I excluded human capital.¹⁰ The results are consistent with the findings reported above. Higher specialization in the production of manufacturing goods is associated with lower market income inequality in Central and Eastern Europe. In contrast, the impact of rising specialization is the opposite in Latin America. It exacerbates income differentials. Manufactured exports as a share of GDP fail to reach statistical significance in the last model but remain positively signed. This might be because manufacturing goods represent a much smaller share of national product in Latin America and thus cannot meaningfully shape the income distribution. These models thus yield additional support for the hypothesized relationships developed above.

2.6.4 De-trended Models

A lingering concern is that the statistically significant relationship between market income inequality and market structure is a product of the temporal trends that characterize the series. The GINI coefficient and the employment shares series exhibit a degree of serial correlation. Although Driscoll-Kraay standard errors correct for temporal autoregressiveness, I resort to de-trending as a further way of addressing these temporal dynamics. I begin by regressing my dependent and main explanatory variables on time. I then re-estimate my models by replacing the original series with the resulting residuals. Since these residuals have been stripped of any linear temporal trend, my results should not be due to any such dynamics¹¹.

As table 5 shows, de-trending does not change my results. Industry and service sector employment shares are still statistically significant in the expected direction. This

¹⁰The results remain the same when I keep human capital but exclude GDP per capita.

¹¹Because my variables might follow a quadratic, rather than a linear trend, I repeated the process by regressing them on time squared. The results remain the same.

effectively addresses the concern that my main explanatory variables and outcome of interest are correlated only because they share a common trend.

Table 2.5: De-trended employment structure and market income inequality in Eastern Europe and Latin America

	CEE Industry	CEE Services	LA Industry	LA Services
	b/se	b/se	b/se	b/se
Industry Detrended	-0.593*** (0.14)		0.190** (0.06)	
Services Detrended		0.416** (0.12)		0.154*** (0.03)
Left Legislature	0.006* (0.00)	0.008* (0.00)	-2.244* (0.93)	-1.725* (0.83)
Democracy	-19.426*** (4.81)	-21.252*** (4.97)	2.073 (1.54)	1.678 (1.32)
Capital Openness	0.197 (0.31)	0.152 (0.33)	0.422* (0.22)	0.503* (0.18)
Trade Openness	-0.023 (0.02)	-0.015 (0.02)	-0.007 (0.01)	-0.004 (0.01)
FDI Inflows	-0.001 (0.02)	-0.008 (0.02)	0.247*** (0.05)	0.244*** (0.05)
GDP per capita Growth	0.008 (0.03)	0.038 (0.03)	-0.024 (0.05)	-0.013 (0.05)
GDP per capita	12.984*** (1.40)	7.379** (2.54)	-5.174** (1.74)	-6.421** (2.19)
Inflation	-0.000 (0.00)	0.000 (0.00)	0.001* (0.00)	0.002* (0.00)
Unemployment	-0.097 (0.10)	0.064 (0.10)	0.003 (0.07)	-0.050 (0.07)
Employment Level	-0.275* (0.14)	-0.027 (0.10)	-0.051 (0.04)	-0.000 (0.04)
Human Capital	-13.945*** (2.83)	-7.633* (3.96)	-1.805 (2.96)	0.225 (2.55)
Public Sector	-0.145* (0.06)	-0.037 (0.06)	0.307** (0.08)	0.292** (0.08)
Remittances	3.710 (13.81)	-10.365 (13.35)	5.391 (6.74)	4.798 (6.46)
Rural Population	0.181 (0.13)	0.387* (0.16)	-0.160** (0.05)	-0.104 (0.08)
Natural Resource Rent	-0.047 (0.29)	-0.030 (0.41)	0.025 (0.05)	0.036 (0.04)
Boom (2003-2013)	0.690 (0.61)	0.857 (0.62)	-0.861 (0.66)	-0.820 (0.62)
Constant	-49.189* (17.57)	-42.531 (25.68)	60.257*** (15.45)	60.975** (19.23)
R-squared	0.579	0.552	0.320	0.332
N	181	181	398	398

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

2.7 Discussion and Conclusion

This paper supports the conclusion that structural transformations matter for the trajectory of market income inequality in Latin America and Central and Eastern Europe. This finding enriches our understanding of an outcome that has so far received little scholarly attention. Empirical research on the income distribution in these two regions has so far largely focused on post-tax-and-transfer dynamics. Recent studies have carefully analyzed governments' redistributive agendas, examining the generosity and universality of their welfare states (Pribble 2015, Huber and Stephens 2012, Garay 2016, Castiglioni 2000, 2001, and 2006), the design and progressivity of their taxation policies (Luna 2016, Fairfield 2010 and 2015), and the decisions of their political elites to intervene in economic life through selective law enforcement (Holland 2016 and 2017). In contrast, few analyses have systematically explored the drivers of income differentials prior to government redistribution. Indeed, with the exception of a couple of studies (Morgan and Kelly 2013, Choi 2017), market income inequality has remained neglected and understudied.

This lack of attention is problematic given that, in the absence of decisive government action (and frequently even in spite of it), the level of market income inequality shapes disposable income inequality dynamics. While governments can use taxes and transfers to fight poverty, address social deficits, and alleviate income differentials, they do not always do so. In reality, many countries outside of the OECD area have underdeveloped or truncated welfare states, which leave large segments of their populations outside of the scope of social protection schemes. This is the case in many Latin American countries, despite recent reforms that sought to broaden the coverage of social programs, expand access to education and health care, and enhance redistribution. Even today, variations in living standards are significant and redistribution is limited (World Bank 2014).

Central and Eastern European countries, in contrast, confronted the imperative to completely overhaul their welfare states and decrease the generosity of social provisions when, over the course of their post-communist transition, they faced substantial financial constraints. As their social protection systems evolved and adapted to changing demographic, productive, and economic conditions, market income dynamics assumed a

dominant role in molding net income inequality. Failing to consider the determinants of market income differentials therefore undermines our understanding of the true causes of inequality within these countries.

In fact, neglecting this dimension can lead to erroneous conclusions about the appropriate policy choices that governments should make in order to alleviate economic inequality. Scholarship on the advanced industrialized world has conclusively shown that deindustrialization and the rise of the service sector have exacerbated wage dispersion (Kollmeyer 2013 and 2015, Huber and Stephens 2001, Wren 2013). Drawing on this research, scholars have expressed concern about the future of emerging economies, whose economic trajectory, while highly dependent on foreign capital and demand, differs vastly from the economic history of their high-income neighbors.

Scholars expected that these late-industrializers' transition to a service-oriented economy would exacerbate income differentials and result in the polarization of the employment structure. This narrative is certainly consistent with the experience of Central and Eastern Europe. In that context, the decline of the manufacturing sector following the collapse of Communism in 1989 left millions jobless. Since many of these workers' skills were not easily transferable, finding alternative employment proved challenging. While the service sector accommodated a large fraction of them, it often rewarded their skills differently. Wage dispersion, therefore, increased steeply as a considerable fraction of people left the relatively homogenous industrial sector and found jobs in services, where high-skill, high-productivity jobs coexist with low-skill, low-value added employment.

Latin America, however, presents a different story. Consistent with existing research, the expansion of the service sector in the region is also associated with rising income differentials. Nevertheless, and contradictory to the logic of the literature on deindustrialization, the growth of industry has also contributed positively to market income inequality. Falling industrial employment is statistically significantly correlated with declining income differentials, even when one accounts for the commodity boom that the continent experienced in the early 2000s. In the period between 1991 and 2012, then, industry has not served as an equalizing force. This result confirms the insights of pre-

vious studies that have highlighted the capital- and technology-intensive nature of Latin American industry. Higher specialization in manufacturing goods might therefore prove incapable of alleviating income differentials, as it contributes to the breach between high-skill, highly educated employees and low-skill, low-productivity workers.

Broadly speaking, then, this finding underscores the importance of temporal and regional effects in the study of structural phenomena. While existing economic research on income inequality frequently assumes that a larger industrial sector is associated with lower income dispersion, my results indicate that this effect is conditional on the type of industry that predominates in each country. Automatically linking deindustrialization or reindustrialization with certain outcomes without consideration of the context in which this process is unfolding therefore risks arriving at erroneous conclusions about the specific effect that the transformation of the industrial sector will have on the income distribution in each country. This analysis thus holds broader implications for ongoing efforts to enhance our understanding of the processes and phenomena that shape the income distribution both inside and outside the advanced industrialized world.

Chapter 3

AGRICULTURE, NATURAL RESOURCES, AND MARKET INCOME INEQUALITY IN CENTRAL AND EASTERN EUROPE

3.1 Introduction

The collapse of communism brought about a steep increase in economic inequality in Central and Eastern Europe. After decades of central planning, which artificially suppressed income differentials and expanded publicly-funded social services, countries in the region experienced a considerable polarization of the employment structure and a notable rise in wage dispersion. Indeed, income inequality increased by an average of nine points during the first six years of the transition (Milanovic 1998). As post-communist governments reduced state intervention in economic life and restructured their economies, the GINI coefficient reached and even exceeded the levels of dispersion in the advanced industrialized world (Roaf et al. 2014). This rapid growth constituted a radical departure from Eastern Europe's postwar history, which established it as the most equal region in the world.

This increase occurred during a period of deep transformation which entailed the post-communist world's integration into the global system of production. After the collapse of the Council for Mutual Economic Assistance, Central and Eastern European countries dismantled barriers to trade and re-established commercial relations with the rest of the world. This process dramatically affected their production structure. While some industries which had previously thrived declined, other sectors' contribution to the economy increased. The primary sector, in particular, has grown as a share of national gross domestic product in the years of the transition.

Although existing scholarship has documented this increase and analyzed its impli-

cations for the political and economic development of the post-communist world, few studies have systematically explored its causes across Central and Eastern Europe. Indeed, the literature on the transition has only recently begun to examine the determinants of inequality in comparative perspective. As a result, much remains unknown about the factors that affect the income distribution in the course of economic liberalization. This is especially true for the distribution of market income, which existing research has so far neglected. While disposable income inequality has received scholarly attention, work on income inequality before taxes and transfers is exceptionally scarce and limited. Consequently, little is known about the forces that affect market income inequality.

This is problematic because the ability of the state to reduce inequality through redistribution greatly fluctuated during the post-communist transition. Facing skyrocketing unemployment, exacerbating economic constraints, and escalating demographic pressures, Eastern European governments struggled to meet the socioeconomic needs of their citizens and redistribute resources. Indeed, alleviating income inequality took a backstage to promoting growth and attaining economic stabilization during the first decade of the transition. Consequently, the creation and development of the welfare state in the region was a long and complicated process that not always addressed emerging challenges, covered diverse constituents or effectively provided protection against new risks. In such environments marked by instability and underdeveloped or exclusionary social protection systems, market income inequality shapes disposable income inequality dynamics. Thus, studying the determinants of market income inequality in Eastern Europe deepens our understanding of economic inequality and enables the analysis of the implications of subsequent policy choices.

This paper intends to fill this gap by examining the relationship between the primary sector and market income inequality in Central and Eastern Europe. To my knowledge, this is the first quantitative paper that addresses this link directly. I argue that although higher employment levels in the agricultural sector reduce income differentials, rising primary goods exports lead to a more inequitable income distribution. This is because technological modernization has lessened this sector's ability to absorb labor. The in-

troduction of new production methods also changed the type of labor that the sector needs. While in the past it employed low-skill workers, it currently also seeks high-skill professionals or cadres with technical education. Thus, the deep transformations that the primary sector has undergone in recent decades and its increasingly technologically intensive profile explain the positive impact that it has on income inequality.

This paper is structured as follows. The next section briefly overviews existing scholarship on income inequality with a special focus on research pertaining to Central and Eastern Europe. I proceed to develop an argument discussing the effect of agricultural employment and commodity production on the income distribution. I posit that declining agricultural employment and rising primary goods exports have exacerbated income differentials. To test this argument, I employ cross-sectional time-series analysis of ten Central and Eastern European countries between 1991 and 2012. The results from the statistical models support my expectations. The fifth section explores the specific ways through which the primary sector affects the income distribution and goes over a number of robustness checks showing that my results are not susceptible to changes in model specification and estimation techniques. I conclude with a discussion of the implications my findings have for further research.

3.2 Literature Review

Research on income inequality in Eastern Europe has proliferated in recent years. While the literature acknowledged the increase in income disparities that accompanied the collapse of communism and the profound implications that this increase has had for the political process in the region (Paczynska 2005, Orenstein 2008, Roaf et al. 2014), the brevity of the transition and the lack of comparable quantitative data limited the scope of the first wave of empirical studies on the topic. Most of these analyses focused exclusively on a small number of countries, comparing the evolution of their income distributions during the first years of the transition. Indeed, only recently have systematic comparisons of multiple states over longer periods become possible.

Existing work has emphasized the effect of economic and political factors. Initial

treatments highlighted the dramatic fall in employment, incomes, and living standards brought about by the recession that accompanied the transition to market capitalism (Milanovic 1998, Ivanova 2007). In the context of intensifying competition and severe economic downturns, many state-owned enterprises lost viability and collapsed, forcing workers into early retirement and leaving millions jobless (Orenstein 2008, Haggard and Kaufman 2008, Keane and Prasad 2002, Giammatteo 2006). A larger retired population led to higher economic inequality either because pensions exceeded average salaries (Heyns 2005) or because they doomed the elderly to poverty (author interviews). In any case, deteriorating economic conditions induced previously unseen labor market volatility and precariousness (Milanovic 1999). Informal economic activity grew rapidly and the prevalence of short-term job contracts offering stringent or practically absent benefits increased (Heyns 2005, Chavdarova 1996 and 2002, Mitra and Yemtsov 2006).

The collapse of traditionally homogeneous sectors and the growth of strongly diverse industries further exacerbated income differentials. Job losses were especially concentrated in manufacturing, which experienced a rapid decline after the dissolution of the Warsaw Pact, and the public sector, which faced serious budget constraints (Nölke and Vliegenthart 2009, Bohle and Greskovits 2012, Stojcic and Aralica 2017, Sznajder-Lee 2017, Cameron 2003). The decrease in industrial employment aggravated wage dispersion because salaries in manufacturing are similar and the sector generates better-paid employment opportunities for low skill-workers (Rodrik 2016). Cuts in public spending, on the other hand, translated into a larger private sector, where remuneration levels depend on productivity that varies widely across occupations and employees (Mahutga and Bandelj 2008). Extending this logic to the self-employed, Heyns (2005), Hanley (2000), Robert and Bukodi (2004) indicate that among that group, some workers earn next to nothing while others report sizeable incomes.

Some have posited that these differences stem from workers' different qualifications. Indeed, the skill premium, or the ratio of the wages of skilled to unskilled workers, increased during the transition (Esposito and Stehrer 2009, Cho and Diaz 2013). Highly educated young professionals, in particular, have experienced noticeable income gains

relative to older, less skilled workers (Hunya and Geishecker 2005). This distinction is especially pronounced in sectors penetrated by foreign capital such as banking and telecommunication that rely on Western technology and managerial practices (Chavdarova 1997). In fact, existing work has shown that foreign direct investment (FDI) could have contributed to the rise in the educational premium by increasing the demand for skilled labor in foreign-owned firms (Mahutga and Bandelj 2008, Geishecker et al. 2004).

The literature has thus acknowledged the exceptionally important role played by external forces and processes. In particular, scholars have highlighted the implications that trade liberalization has had for employment and internal restructuring dynamics in the post-communist world (Mitra and Yemtsov 2006, Halmos 2011, Bohle and Greskovits 2007 and 2012, Sznajder Lee 2012 and 2017, Falzoni et al. 2004, Egger and Stehrer 2003). While integration in the world economy forced some noncompetitive labor-intensive industries into bankruptcy, it also spurred the growth of other sectors. Furthermore, as the recipient of the largest amount of capital flows in the world in the 2000s (Becker et al. 2010), Eastern Europe was transformed by foreign direct investment. Existing work speculates that FDI has promoted the growth of the more diverse services sector, increased the pay gap between management and labor, and raised the income differentials among workers in domestic and foreign firms (Mahutga and Bandelj 2010, Mihaylova 2015, Esposito and Stehrer 2009).

Competition for such investment also has the potential to affect the income distribution. In this case, however, politics mediate the relationship between global factors and local outcomes. Domestic elites' desire to attract investment led to the adoption of policies that weakened the bargaining position of labor against capital, limited national governments' ability to counteract market forces, and decreased the state's capacity to redistribute income (Appel and Orenstein 2016, Sznajder-Lee 2011). Recognizing their reliance on foreign capital in an era of intensifying competition and under "intense pressure to exceed others" (Orenstein and Appel 2016, p. 316), cabinets of different composition and ideological stripes largely adhered to similar, pro-business economic policies.

Eastern Europe's dependent model of growth and development has thus largely erased partisan differences in economic policymaking and resulted in a neoliberal consensus that exceeds externally-imposed requirements and international financial institutions' recommendations (Grzymala-Busse and Innes 2003, O'Dwyer and Kovalcik 2007, Orenstein and Appel 2016). This empirical reality contradicts powerful theoretical perspectives that expect different parties to pursue different policies depending on their ideological orientation (Bradley et al. 2008, Huber and Stephens 2001 and 2012). This neoliberal policy status quo has prevented concerted action against rising income differentials.

Apart from the imperative to appeal to foreign capital, this "enthusiastic and persistent" (Orenstein and Appel 2016) convergence around a less interventionist economic model has been seen as a consequence of Eastern Europe's integration into the European Union (Grzymala-Busse and Innes 2003, O'Dwyer and Kovalcik 2007). The accession process entailed the adoption of the voluminous *acquis communautaire*, gave external actors considerable leverage over the reform process, and demanded a substantial reduction in state involvement in economic life (Vachudova 2005, Cameron 2003). Consequently, post-communist governments faced a limited policy options space. The implementation of the liberalizing reforms required by the European Union and imposed by the transition brought about an increase in income inequality across the region (Heyns 2005, Orenstein 2008, Ivanova 2007, Izyumov and Claxton 2008). Specifically, the removal of price controls decreased the purchasing power of the lower classes while the privatization process benefited the rich and introduced wage dispersion (Bulir 2001, Birdsall and Nellis 2003, Mitra and Yemtsov 2006, Milanovic and Ersado 2008, Haggard and Kaufman 2008, Milanovic 1999, Ivaschenko 2002, Keane and Prasad 2002, Gerry and Mickiewicz 2008, Mahutga and Bandejl 2008).

The speed and comprehensiveness of these reforms also mattered for the income distribution. Consistent with the literature on Latin America (Huber and Solt 2004), a faster and deeper economic liberalization was initially linked to higher income inequality (Roland 2004). In this vein, powerful executives insulated from popular pressures could potentially create conditions conducive to more pronounced income differentials as they

had full control over policy-making (Przeworski 1992). In the second stage of the reform process, when resistance to further reform was stronger, weak governments in poorly institutionalized party systems were better positioned to adopt neoliberal policies as they did not have to fear electoral accountability (O'Dwyer and Kovalcik 2007). In contrast, a more gradual adoption of market-oriented reforms was expected to lead to a slower increase in income differentials. Such a gradual reform process, however, also heightened the risk of partial reform whereby a group of winners tried to prevent further liberalization in an attempt to capture rents and maintain monopolies (Hellman 1998). A similar equilibrium would invariably hurt the poor, generating a gap between both groups.

The literature on income inequality in Eastern Europe world has thus highlighted a variety of factors that have affected the income distribution in the aftermath of the transition. Despite the emphasis placed on structural economic processes, however, existing scholarship has largely ignored the impact of the primary sector. This sector underwent profound transformations in the 1990s and the 2000s. It experienced the adoption of new technologies, the privatization of land, the collapse of collective farming, and the rapid integration in the global system of production. These changes overlapped with a commodity boom in the early 2000s which witnessed a dramatic increase in the price of commodity prices worldwide. These events have the potential to affect the income distribution not only by altering the employment structure but also by destroying existing income streams and creating new sources of income. This paper attempts to contribute to our understanding of these processes in the post-communist world.

3.3 Theoretical Framework

The twentieth century dramatically reshaped Central and Eastern Europe. The Second World War found the region war-torn and lagging behind Western Europe in economic development. Although some of these countries, especially Poland and Czechoslovakia, had started to modernize, most economies remained underdeveloped, predominantly rural, and dependent on foreign capital (Simons 1991). The heavy destruction suffered during the war brought about substantial economic crises and complicated economic recovery. In

the aftermath of the Communist revolution, Eastern Europe underwent rapid nationalization, violent collectivization, accelerated industrialization, and gradual incorporation into the Soviet Union-led Council for Mutual Economic Assistance (CoMeCon). The creation of new industries spurred urbanization and large-scale migration to large cities. Socialist governments invested heavily in public works, expanded access to education, and intensified trade with other socialist countries.

Despite these transformations, the primary sector remained a significant source of economic activity (Simons 1991). Indeed, although its importance had lessened over time, it still employed around 20% of the labor force and contributed approximately 15% to national income across Bulgaria, Czechoslovakia, Hungary, Poland, and Romania in 1980 (Turnock 1996). While the expansion of education and the growth of the public sector generated new employment opportunities, agriculture and mining absorbed a substantial proportion of the surplus unskilled labor (Turnock 1996). Remuneration levels in the sector varied across the region, but rapid increases in demand for food and ores and metals and exacerbating production deficits during the 1950s and the 1960s drove wages up in many countries. The primary sector, therefore, continued to provide employment and decent wages for relatively poorly qualified workers.

The fall of communism in the late 1980s completely overhauled the sector. National governments faced the imperative of deciding how to privatize the assets the communist authorities had collectivized decades ago. The collapse of public cooperatives induced a substantial fall in production. The restitution process, which returned publicly-owned land to its previous private owners, further disrupted productive processes. In some cases, city dwellers who had never lived in the countryside received extensive parcels in territories crucial for sustaining production (author interviews). In others, multiple heirs meant that previously consolidated properties were split into numerous smaller parcels. The resulting fragmentation and the new owners' lack of experience created new challenges for the agricultural sector. As far as mining was concerned, privatization, exhaustion, and concessions drove some mines into closures.

A further challenge were the external pressures the primary sector faced in the 1990s.

The liberalization of trade with the rest of the world exposed Eastern European agriculture and mining to competition from abroad. This competition was rather uneven: while the EU accession process required post-communist states to eliminate government interference in markets and open up to international trade, the Block sought to protect Western European agricultural producers and did not give candidate countries equal access to its markets (Vachudova 2005). Because accession countries were more reliant on their primary sectors, the European Union feared that they would pose a threat to its own member-states. Furthermore, because steel was such a sensitive sector, it enjoyed special protection in the Union. Simultaneously, Eastern European economies faced the collapse of the CoMeCon, which had provided a market for their goods. In this sense, in addition to witnessing the dramatic restructuring of the primary sector and the withdrawal of state support, post-communist producers also experienced intensified competitive pressures that they were in a weakened position to withstand.

The primary sector thus faced a decline during the early years of the transition. The restructuring of productive enterprises and the interruption of traditional commercial transactions resulted in the collapse of some producers and the emergence of many small-scale, subsistence farmers. As a result, the sector no longer employed as many workers as it had under communism. The adoption of modern technology and the introduction of new production methods further undermined agriculture's capacity to absorb labor. Although production had changed under communism, becoming increasingly mechanized, the sector still employed relatively outdated machinery at the beginning of the transition (Turnock 1996). The process of modernization that began in the 1990s, therefore, reshaped Eastern European agriculture and significantly decreased its demand for labor.

The reorganization of production thus decreased the proportion of the region's labor force engaged in the primary sector. This drop not only generated unemployment, but also had the potential to exacerbate economic inequality. A labor-intensive primary sector generally pays homogeneous wages, keeping income differentials low. It also provides employment opportunities for low-skill workers. In contrast, a more technologically sophisticated sector can increase wage dispersion. Capital-intensive sectors not only do

not need as much labor, they also seek relatively better trained workers who can operate modern machinery. Thus, the transformation of the primary sector is likely to have had important implications for income inequality in Eastern Europe.

Because the transition coincided with this modernization process whereby agriculture shed labor and ceased to perform the equalizing role it had had in the past, I expect that

- *Hypothesis 1: The decline of agricultural employment in Central and Eastern Europe is associated with higher market income inequality.*

Nevertheless, my expectations for trade with primary goods in the region are different. By the end of the 1990s, the sector had started to recover. Indeed, primary goods exports increased during the late 1990s and the 2000s. Because this increase occurred when most of these industries had become more capital-intensive, had ceased to demand much labor, and had passed into private hands, I expect that

- *Hypothesis 2: Larger primary goods exports in Central and Eastern Europe are associated with higher market income inequality.*

This is because the gains from trade with such goods probably go to capital owners, land owners, and relatively skilled workers. These groups were already better positioned to benefit from the transition away from communism than other segments of society which did not own assets and lacked better qualifications. I therefore hypothesize that higher exports from the post-communist world's transformed primary sector would contribute to widening income differentials in the region.

3.4 Empirical Analysis

To evaluate this argument, I employ cross-sectional time-series analysis of 10 Central and Eastern European countries. These states – Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia – all formed part of the former Communist Bloc between the late 1940s and the late 1980s. As a result, they witnessed the nationalization of private property, the collectivization of agricultural land, and the establishment of state-controlled production. After the collapse of communism in

1989, they all had to dismantle state control, re-organize production, and privatize state-owned land and assets. Although different countries adopted different policies, they faced similar challenges and adhered to similar principles. The latter were partly dictated by the geopolitical goal of joining the European Union (EU). The early 90s saw all of these states initiate negotiations for membership in the EU, eventually gaining accession in the 2004 and 2007 enlargement waves. The historical trajectory of these ten countries throughout the 1990s and the 2000s was therefore strongly affected by the accession process, which largely determined the broader type of economic, political, and judicial reforms that they pursued (Vachudova 2005).

In contrast, the states which in the past formed part of the Soviet Union experienced stalled reform attempts, authoritarian reversals, and uneven economic liberalization. As part of the SSSR, these countries strongly depended – both politically and economically – on Russia. Under communism, they underwent limited industrialization. After 1992, they faced simmering ethnic tensions, political instability, and state capture. Political competition and economic reforms remained limited and incomplete well into the 2000s. Many of the members of the Commonwealth of Independent States are thus still lagging behind their Central and Eastern European neighbors not only in political democratization, but also in economic development, diversification, and liberalization. Furthermore, these countries are not subject to the same regulations and policies followed by the European Union. Because of these differences, they are excluded from my sample.

The analysis starts in 1992. This initial point is imposed by one practical limitation and one theoretical consideration. Pragmatically, the inclusion of the first years of the transition is impossible due to missing data. Because this period was exceptionally turbulent, domestic statistical offices often faced considerable challenges related to data collection. Consequently, data availability issues force me to drop the years before 1992. Theoretically, this exclusion is justified because the beginning of the transition was unique and highly unusual. It witnessed countries' attempts to create a private sector and completely rebuild their economies. Starting the analysis in 1992, when most of Central and Eastern Europe had stabilized after the devastating crisis that accompanied the collapse

of communism and had initiated the process of economic restructuring and integration into the global system of production, thus helps to ensure that this exceptional period in the history of the region does not drive or bias my results. The endpoint is 2012.

The dependent variable, the pre-tax-and-transfer GINI coefficient, reflects the level of market income inequality in a given year. The market income GINI index captures the overall disparity characterizing the income distribution of a nation's residents before redistribution. This focus on the entire income distribution is appropriate given my interest in structural transformations affecting the entire employment structure. Furthermore, since my argument highlights the impact of sectoral economic processes, I choose to ignore the role of government intervention through transfers and taxes at this stage of the analysis. Data are available through the Standardized World Income Inequality Database (SWIID), which homogenizes and standardizes data from various sources¹ to enable cross-country comparability (Solt 2009). The SWIID is currently the most extensive dataset on inequality in terms of its geographical and temporal coverage, providing comparable observations for all of the countries in my sample.²

As illustrated by Figure 1, market inequality exhibits substantial variation over the period under examination. Market-generated income disparities are relatively low around 1990. This low starting point reflects the equalizing influence of the socialist economic model, which suppressed income differentials and artificially homogenized pay levels across occupations of different productivity and skill levels. Obvious exceptions to this trend are Poland and Hungary, where economic reforms began in the late 1980s and which had attained a degree of market liberalization by the time communism collapsed. Market inequality increased throughout the region over the course of the 1990s. In some cases, this rise was steep and concentrated during the first years of the transition, with income inequality stabilizing around the late 1990s or the mid-2000s. In others, it was

¹Such as the Luxembourg Income Survey (LIS) and the World Institute for Development Economics Research at the United Nations University.

²The fifth version of the dataset contains 100 separate time-series imputations for each state to account for uncertainty. Following the standard practice recommended by Solt, the dependent variable used here is the mean of the 100 imputed series. To check the robustness of my findings, I also carry out the analysis with the median, minimum, and maximum of these 100 imputed series.

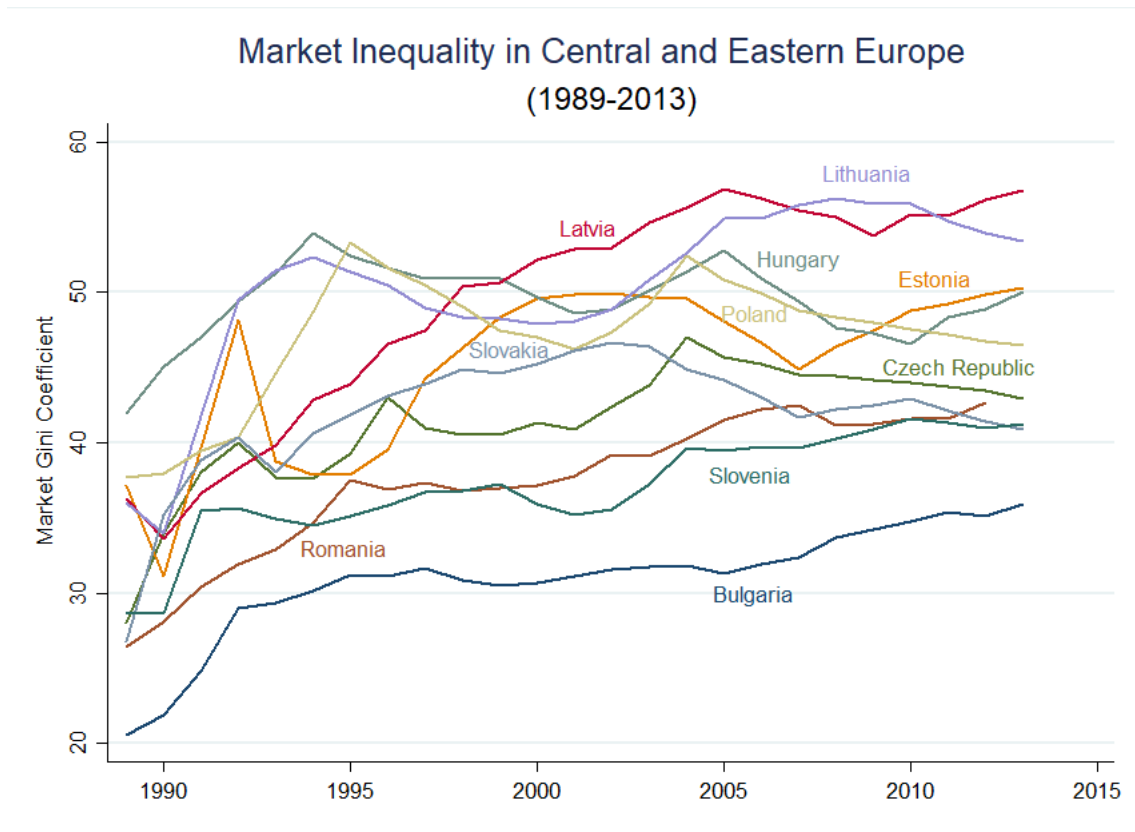


Figure 3.1: Market Income Inequality in Central and Eastern Europe (1990-2013)

more gradual and persistent, continuing throughout the first twenty-five years of the transition. The early 2010s therefore witnessed considerable diversity in market inequality levels: while some Eastern European states, such as Bulgaria, Slovenia, and Romania, had succeeded in keeping differentials relatively low, others, such as the Baltic States, experienced much higher dispersion.

The main independent variables capture trends in commodity employment and production. Agricultural employment reflects the proportion of total employment engaged in the agricultural sector.³ As figure A1.1 in Appendix 1 indicates, this sector absorbed much fewer workers in the 2010s than it did in the 1990s. Indeed, agricultural employment has followed a downward trend throughout the region in the last three decades, decreasing by approximately 50%, from 17 percent of total employment in 1992 to 9% in 2012. This process has been uniform across all ten countries included in my analysis

³The agricultural sector consists of activities in agriculture, hunting, forestry, and fishing, in accordance with category A (ISIC 4).

despite the different size of the agricultural sector in the early 90s. Together with deindustrialization, this reduction constitutes one of the most meaningful transformations in the employment structure of the post-communist world brought about by the transition.

I further examine the impact of the commodity producing sector on the distribution of market income by focusing on each economy's primary goods exports. Primary exports reflect commodity exports as a proportion of each economy's GDP. Agricultural exports, foods exports, fuels exports, and metals and ores exports capture the main categories subsumed under commodities. Disaggregating the primary goods measure into its different components allows me to check whether specialization in the production of different commodities has a differentiated effect on inequality. A series of models replacing these measures with commodity exports as a percent of total exports are presented in the appendix.

A set of variables accounts for the effect of alternative explanations. Logged GDP per capita, inflation, GDP growth, and unemployment rates reflect changing economic conditions. Trade openness, foreign direct investment flows, and capital account liberalization capture the impact of globalization. Employment in the industrial sector controls for deindustrialization. Rural population measures the urban-rural divide. Since the public sector might alleviate market income inequality by absorbing labor, suppressing income differentials, or influencing the supply and demand for goods and services, I add government final consumption. I include remittances as a share of GDP to account for the additional income that citizens living abroad send home. Lastly, consistent with existing scholarship on regime type and partisan ideology, I include V-Dem's electoral democracy index and a control for left parties' share in national legislatures. A dummy variable accounts for the period of rising commodity prices between 2003 and 2012.

Cross-sectional time-series analysis presents several substantial challenges that make the standard application of Ordinary Least Square (OLS) regression inappropriate (Hicks 1994). A fundamental assumption of OLS is that disturbances are independent from each other. In panel data, however, observations are linked in highly structured ways. Thus, pooled data produce temporally autoregressive and cross-sectionally correlated error

terms, which result in biased and inconsistent parameter estimates (Hicks 1994; Huber, Huo, and Stephens 2016). To address this problem, I estimate fixed effects models with Driscoll-Kraay standard errors. Fixed effects models essentially absorb cross-sectional variation by introducing country dummies. They control for all time-invariant differences between cases, while simultaneously allowing unobserved country-characteristics to freely correlate with time-varying covariates (Bollen and Brand 2010). Fixed effects models thus focus on the temporal variation within panels. This makes them particularly appropriate for the study of the causes of change over time. Furthermore, Driscoll-Kraay standard errors (DSKES) correct for spatial dependence (Driscoll and Kraay 1998). An alternative to traditionally used panel corrected standard errors, DKSEs are heteroscedasticity-consistent (Hoechle 2007). My model specification and estimation technique are therefore conservative, ensuring that I am subjecting my argument to a particularly difficult test.

3.5 Results

Tables 1 and 2 below present the results from the statistical analysis. Models 1, 2, and 3 examine the impact of employment in the agricultural sector on the market income GINI coefficient in Central and Eastern Europe. Model 1 is a bivariate regression whereas model 2 adopts the full specification. Model 3 is a robustness check replacing agricultural employment with the value added of the agricultural sector. Models 4 through 8 in table 2 explore the effect of primary goods exports on the income distribution. Model 4 includes the broad commodity measure while models 5 through 8 disaggregate this measure by looking into the impact of agricultural, foods, fuels, and metals and ores exports. The R² values yielded by the regressions indicate that the models fit the data well and explain a substantial amount of variation in market income inequality.

Table 1 suggests that higher employment in the agricultural sector is associated with lower market income inequality, holding the impact of other variables constant. Agricultural employment is negatively signed and statistically significant in models 1 and 2. This suggests that the sector can play the role of a buffer, suppressing exacerbating income differentials. This might be because wages in this sector are fairly homogeneous. It has

historically employed low-skill workers whose productivity levels did not differ substantially. Nevertheless, as revealed by figure 2, the proportion of the labor force engaged in agriculture has declined over the course of the post-communist transition. This transformation in the sector's capacity to absorb labor is likely to have led to higher market income inequality. In the future, it might not only cease to provide jobs for a considerable proportion of the labor force, but it might also start seeking more highly qualified cadres capable of working with the new machinery adopted by agricultural producers. Agriculture's equalizing impact on the income distribution has thus likely lessened, as its size has decreased significantly. As the sector continues to develop and its labor needs change, it might lead to higher inequality.

Table 3.1: Agricultural employment and market income inequality in Eastern Europe

	Model 1	Model 2	Model 3
	b/se	b/se	b/se
Agricultural employment	-0.469*** (0.05)	-0.405* (0.15)	
Agriculture (value added)			-0.261* (0.13)
Industrial employment		-0.622*** (0.11)	-0.360* (0.15)
Democracy		-16.425** (4.43)	-14.804*** (3.76)
Left seats		0.010** (0.00)	0.010** (0.00)
Capital account openness		-0.118 (0.28)	-0.423* (0.23)
Trade		-0.056* (0.02)	-0.048* (0.02)
FDI inflows		0.013 (0.03)	-0.002 (0.03)
GDP growth		0.111*** (0.02)	0.093*** (0.02)
GDP per capita		1.194 (3.01)	6.086*** (1.20)
Inflation		0.001 (0.00)	0.003* (0.00)
Unemployment		-0.068 (0.07)	0.062 (0.04)
Government consumption		-0.138* (0.07)	-0.110 (0.08)
Remittances		-14.964 (13.25)	-19.010* (9.77)
Commodity boom		1.028 (0.59)	1.003* (0.55)
Constant	50.094*** (0.59)	80.350* (32.72)	16.837 (13.02)
R-squared	0.219	0.449	0.424
N	253	181	180

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 3.2: Primary exports and market income inequality in Eastern Europe

	Model 4	Model 5	Model 6	Model 7	Model 8
	b/se	b/se	b/se	b/se	b/se
Primary exports	28.135** (7.33)				
Agricultural exports		99.264* (47.21)			
Food exports			42.600* (16.30)		
Fuel exports				17.148 (14.88)	
Ores and metals exports					50.037* (23.48)
Industrial employment	-0.328* (0.15)	-0.268 (0.18)	-0.370* (0.14)	-0.361* (0.16)	-0.318* (0.15)
Democracy	-15.505** (4.07)	-20.816*** (4.26)	-17.215*** (3.23)	-16.794*** (4.06)	-15.452** (4.29)
Left seats	0.008* (0.00)	0.010** (0.00)	0.009* (0.00)	0.009** (0.00)	0.010** (0.00)
Capital account openness	0.014 (0.23)	-0.322 (0.28)	-0.055 (0.20)	-0.051 (0.28)	-0.317 (0.18)
Trade	-0.086** (0.02)	-0.060** (0.02)	-0.074*** (0.02)	-0.061* (0.03)	-0.060* (0.02)
FDI inflows	-0.004 (0.03)	0.003 (0.03)	0.019 (0.03)	-0.007 (0.02)	-0.018 (0.03)
GDP growth	0.102** (0.03)	0.057* (0.03)	0.118*** (0.02)	0.093*** (0.02)	0.090*** (0.02)
GDP per capita	6.004*** (0.83)	9.390*** (1.05)	6.899*** (1.14)	6.728*** (0.92)	7.613*** (0.67)
Inflation	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Unemployment	0.029 (0.05)	0.089* (0.05)	0.046 (0.04)	0.046 (0.06)	0.093* (0.04)
Government consumption	-0.036 (0.07)	-0.077 (0.06)	-0.012 (0.09)	-0.081 (0.07)	-0.074 (0.07)
Remittances	-8.758 (13.13)	-9.784 (11.10)	-15.981 (11.19)	-13.224 (11.32)	-14.596 (11.45)
Commodity boom	1.178* (0.52)	1.106* (0.63)	1.196* (0.57)	0.855 (0.57)	1.020* (0.51)
Constant	15.326 (10.96)	-16.214 (15.51)	8.705 (9.31)	11.039 (13.52)	-0.909 (8.90)
R-squared	0.455	0.436	0.431	0.409	0.418
N	179	179	179	179	179

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 2 alludes to this trend. While agricultural employment has decreased in Central and Eastern Europe over the last 25 years, primary goods exports coming from the region have not (see figure 3). Focusing on employment alone therefore does not illuminate all

ways in which the primary sector affects the income distribution, not only because agricultural employment does not capture employment in other primary goods industries such as mining, but also because of changing production techniques. Examining the impact of primary goods exports thus enriches my analysis and paints a more complete picture of the variegated mechanisms linking the primary sector to market income inequality. Models 4 through 8 present the results from this part of the analysis.

In contrast to the sectoral employment effect described above, primary goods exports are associated with an increase in market income inequality. The aggregate measure of commodity exports is positively signed and statistically significant in model 4.⁴ Rising primary exports in the late 90s and the 2000s have thus made the market income distribution in post-communist Eastern Europe less equitable. This might be because the sector increasingly relies on modern technology and no longer employs as much low-skill labor as it used to. The epiphenomenal processes of declining employment levels and higher technological intensity might thus widen income differentials. This effect might be complemented by the fact that once collectivization was reversed, the sector transitioned to a more concentrated ownership structure which is associated with more concentrated and unevenly distributed gains. This finding thus complements the conclusion that a larger primary sector suppresses market income inequality.

The different categories of primary goods included in this analysis confirm the results above. Agricultural exports, foods exports, and metals and ores exports all return positively signed statistically significant coefficients. Rising exports in these categories therefore have an inequality-exacerbating effect. As previously noted, all of these sectors have substantially changed their profiles since the communist period. Agriculture has become more automated whereas metal extraction has become mechanized. These trends might thus explain why exports from these sectors are associated with higher income inequality. If fewer, more skilled people work in them, they might be contributing to rising income differentials. In contrast, fuels exports fail to reach statistical significance.

⁴This result remains robust to different operationalizations of commodity exports excluding fuels or adding precious stones and non-monetary gold.

This is not surprising given that most of Central and Eastern Europe does not export energy and depends on energy imports. For this reason, fuel exports are dropped from any further analyses.

A few other findings are worth noting. Democracy returns a negatively signed statistically significant coefficient. Deepening democracy, as measured by the V-Dem polyarchy index, has produced more equitable market income distributions. This might be because democratic governments have been more responsive to citizen demands to take measures against rising income differentials. Resistance to economic inequality tends to be higher in Central and Eastern Europe, where citizens lack experience with inequality and view widening wage differences in negative light (Pop-Eleches and Tucker 2017). The lower social tolerance toward inequality might thus have fueled some government action to prevent further increases in income dispersion.

In contrast, left-wing parties are positively associated with growing market income inequality. Consistent with scholarship on Eastern Europe, the positive coefficient attached to the share of legislative seats occupied by left-wing candidates contradicts the expectation that left-leaning parties oppose widening income differentials and adopt policies to ameliorate rising polarization. The Left in Central and Eastern Europe thus behaves differently from its Western European and Latin American counterpart, which, according to existing scholarship, pursues a more egalitarian agenda (Huber and Stephens 2001 and 2012). This might be because left-wing administrations were charged with pursuing market-oriented reforms and attracting foreign capital in the course of the transition (Appel and Orenstein 2016). As Tavits and Letki (2003) show, the Left in the region had more political capital and greater room to maneuver when it came to implementing neoliberal policies because, contrary to the Right, it boasted a stable political base.

Several of the economic controls also reach statistical significance. A larger industrial sector is associated with lower market income inequality. The negative and statistically significant coefficient attached to industrial employment confirms the conclusion, popular in existing research on the advanced industrialized world, that the industrial sector has an equalizing impact on the income distribution. In the context of Central and Eastern

Europe, this implies that deindustrialization, or the loss of industrial employment, has widened income differentials. Trade also appears to alleviate market income inequality. Rising exposure to trade is related to a lower market income GINI coefficient in the region. This suggests that integration into the global economy might have prevented a further rise in inequality.

In contrast, economic growth and GDP per capita return positively signed coefficients. Inequality rose faster in richer economies. A larger per capita income is associated with higher market income inequality. This is consistent with graph 1, which reveals a sharp rise in the GINI coefficient in Poland, Hungary, and the Baltic States. Faster growing economies also appear to have become unequal more quickly. Economic growth between the mid-1990s and the early 2010s therefore seems to have been unbalanced. The period of prosperity that Central and Eastern Europe experienced did not benefit everybody equally. The rest of the economic controls remain insignificant.

3.6 Who Benefits from the Primary Sector?

3.6.1 Quintiles Income Shares

The analysis so far suggests that falling agricultural employment and rising exports of commodities are correlated with growing market income inequality. But how exactly do employment in agriculture and trade with primary goods affect the income distribution? How do they change the relative incomes of different segments of society? Who benefits and who loses? Which groups receive the economic gains associated with these commercial patterns?

Answering these questions requires looking at the different parts of the income distribution. While my current dependent variable, the GINI coefficient, reflects changes in inequality, it does not reveal which parts of the income distribution experience income gains and which witness their income decline. The GINI coefficient is an aggregate statistic. Multiple configurations can produce the same value. In contrast, a focus on the income shares of specific groups can illuminate the precise ways through which commodity exports and agricultural employment influence inequality.

To gain additional insight into the implications of primary employment and trade with commodities for economic inequality in Central and Eastern Europe, I thus replace my dependent variable with the income share of the richest and the poorest twenty percent. My new outcome of interest is the share of national income going to the top and the bottom quintile of the income distribution.⁵⁶ This focus allows me to explore the changes in the relative economic well-being of these groups and to assess whether trade with commodities boosts the income of the poor relative to the richer fragments of the population or if it concentrates income in the hands of the already well-off.

Table 5 below shows the results from the models run against the ratio between the income shares of the top 20 and the bottom 20 percent. Calculated using both income shares, the ratio is more informative as it summarizes their co-movement. Rising values imply that the rich claim a higher proportion of national income, which means that they experience more substantial income gains than the poor or that their income shrinks less than the income of the bottom 20 percent. Falling values suggest that the poor's income grows faster than the elites'. Tables A2.3 and A2.4 in Appendix 2 present the regressions with the top 20 and the bottom 20 income shares.⁷

⁵Additional robustness checks using the top and the bottom decile of the income distribution yielded largely similar results.

⁶Data come from the Global Income and Consumption Project, which collects income, consumption, and inequality data for the 1960-2015 period.

⁷The decile models are available upon request.

Table 3.3: The primary sector and the top / bottom quintile ratio in Eastern Europe

	Model 9	Model 10	Model 11	Model 12	Model 13
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.172* (0.07)				
Primary exports		22.487*** (4.15)			
Agricultural exports			67.279* (29.41)		
Foods exports				32.427** (8.54)	
Ores and metals exports					-8.426 (7.71)
Industrial employment	-0.125 (0.09)	0.011 (0.10)	0.041 (0.09)	-0.028 (0.09)	-0.024 (0.10)
Democracy	0.751 (4.46)	1.250 (4.35)	-1.454 (4.49)	0.991 (4.43)	0.295 (4.33)
Left seats	0.000 (0.00)	-0.000 (0.00)	0.001 (0.00)	-0.000 (0.00)	0.000 (0.00)
Capital account openness	0.739*** (0.14)	0.732*** (0.16)	0.660*** (0.15)	0.847*** (0.14)	0.772*** (0.14)
Trade	-0.008 (0.01)	-0.024* (0.01)	-0.013 (0.01)	-0.024* (0.01)	-0.007 (0.01)
FDI inflows	-0.005 (0.02)	-0.008 (0.03)	-0.009 (0.03)	0.003 (0.02)	-0.010 (0.03)
GDP growth	0.004 (0.02)	0.001 (0.02)	-0.028* (0.01)	0.016 (0.02)	-0.005 (0.02)
GDP per capita	-4.237** (1.43)	-1.829* (0.91)	-0.619 (0.66)	-2.389* (1.04)	-1.739* (0.88)
Inflation	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Unemployment	-0.084* (0.03)	-0.029 (0.04)	-0.017 (0.04)	-0.049 (0.03)	-0.032 (0.04)
Government consumption	-0.168* (0.09)	-0.118 (0.09)	-0.155 (0.11)	-0.105 (0.09)	-0.157 (0.11)
Remittances	27.797** (8.91)	31.694** (10.52)	33.795** (11.39)	29.415** (9.26)	29.304** (8.88)
Commodity boom	-0.406 (0.34)	-0.197 (0.35)	-0.313 (0.31)	-0.211 (0.36)	-0.489 (0.32)
Constant	56.517** (17.93)	24.442* (12.54)	13.969 (10.03)	31.591* (12.56)	26.335* (12.84)
R-squared	0.165	0.181	0.179	0.183	0.136
N	182	180	180	180	180

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Together, the three tables reveal a consistent picture. The primary sector employment and almost all of the commodity exports variables are statistically significant. The negatively signed coefficient returned by agricultural employment suggests that a larger sector

can boost the income of the poor, most likely by expanding the employment opportunities available to them. The aggregate primary goods measure indicates that rising exports are connected to a higher top 20 / bottom 20 ratio. This implies that the economic gains from engaging in trade with commodities likely do not go to the poorest in Central and Eastern Europe but accrue to the wealthy elites, exacerbating the income gap between the two groups. The models in tables A2 and A3 corroborate this conclusion: higher commodities exports are indeed associated with a decrease in the income share of the bottom 20 percent of the income distribution and an increase in the income share of the top 20 percent. Thus, they bring gains – either in the form of higher salaries or noticeable rents – to the richest in society. Agricultural exports and foods exports behave similarly. Ores and metals exports fail to reach statistical significance.

These models thus confirm the general logic of the main empirical analysis. A labor-absorbing agricultural sector can ameliorate income differentials. The exportation of primary goods in Central and Eastern Europe, however, has the potential to exacerbate inequality. While trade with commodities boosts the fortunes of the most well off, it decreases the share of national income going to the poorest quintile.

Two other findings are worth noting. First, both democracy and partisanship lose their statistical significance when the dependent variable is the ratio between the top and the bottom quintile's income shares.⁸ Thus, these two political factors do not appear to directly affect the proportion of income going to the richest and the poorest quintiles. This implies that the effect of democratic governments and leftist legislatures on the income distribution might take place primarily through their impact on the middle classes. Second, remittances are a statistically significant predictor of the top 20 / bottom 20 percent ratio in Eastern Europe. This is not surprising, given the high levels of emigration that the region experienced during the transition. The financial resources sent by residents living abroad, however, exacerbate income differentials, which suggests that wealthy families might be the ones receiving money from relatives who left the country.

⁸Tables A2.3 and A2.4 in Appendix 2 show that these variables also return statistically insignificant coefficients in the shares models.

3.6.2 Labor Income Shares

What is the nature of the gains and losses that trade with commodities entails? Does it contribute to wage polarization? Or are rents responsible for this outcome?

Although fully answering this question is impossible, I can begin to investigate these dynamics by looking at each economy's total labor share. The labor share reflects the share of national GDP going to the compensation of employees. A positive correlation between commodity exports and total labor share implies that rising exports create additional employment opportunities or boost the salaries of the workers in the exporting sectors or simultaneously affect both remuneration and the size of the labor force engaged in the primary sector in such a way that the proportion of national output going to labor is higher. In contrast, a negative relationship suggests that although these sectors generate exports, they shed labor or pay lower remuneration or influence both employment and pay in such a way that workers receive a lower fraction of income than before. While distinguishing between the remuneration and the size effects – which are not mutually exclusive – is difficult with available data, assessing patterns in the co-movement of the labor share and commodity exports does reveal information about the cumulative impact of the primary sector on workers' aggregate income.

Table 3.4: The primary sector and the total labor share in Eastern Europe

	Model 14	Model 15	Model 16	Model 17	Model 18
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.000 (0.00)				
Primary goods exports		-0.218** (0.07)			
Agricultural exports			-1.658*** (0.28)		
Foods exports				0.208 (0.12)	
Ores and metals exports					-0.529* (0.29)
Industrial employment	0.003 (0.00)	0.003 (0.00)	0.001 (0.00)	0.003* (0.00)	0.003 (0.00)
Democracy	-0.291*** (0.04)	-0.272*** (0.04)	-0.217*** (0.04)	-0.295*** (0.04)	-0.276*** (0.04)
Left seats	0.000* (0.00)	0.000* (0.00)	0.000* (0.00)	0.000* (0.00)	0.000* (0.00)
Capital account openness	-0.007* (0.00)	-0.008** (0.00)	-0.006* (0.00)	-0.006* (0.00)	-0.007* (0.00)
Trade	0.000 (0.00)	0.000 (0.00)	0.000* (0.00)	0.000 (0.00)	0.000 (0.00)
FDI inflows	-0.000 (0.00)	-0.000 (0.00)	-0.001* (0.00)	-0.000 (0.00)	-0.000 (0.00)
GDP growth	-0.002*** (0.00)	-0.002*** (0.00)	-0.001** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)
GDP per capita	0.030 (0.05)	0.030 (0.04)	-0.000 (0.03)	0.027 (0.04)	0.032 (0.04)
Inflation	-0.000 (0.00)	-0.000 (0.00)	-0.000** (0.00)	-0.000 (0.00)	-0.000 (0.00)
Unemployment	-0.001 (0.00)	-0.001 (0.00)	-0.002 (0.00)	-0.001 (0.00)	-0.001 (0.00)
Government consumption	0.004* (0.00)	0.004** (0.00)	0.004* (0.00)	0.004** (0.00)	0.005** (0.00)
Remittances	-0.030 (0.29)	-0.014 (0.30)	-0.229 (0.21)	-0.056 (0.30)	-0.002 (0.29)
Commodity boom	-0.001 (0.01)	-0.002 (0.01)	-0.005 (0.01)	-0.000 (0.01)	-0.001 (0.01)
Constant	0.219 (0.57)	0.209 (0.47)	0.538 (0.38)	0.252 (0.47)	0.192 (0.46)
R-squared	0.391	0.404	0.511	0.398	0.401
N	151	151	151	151	151

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 4 reruns the models from the main analysis against the total labor share.⁹

⁹Data are available through Karabarounis and Neiman 2014.

The output indicates that rising commodity exports – agricultural goods, foods, or ores and metals – are associated with a falling total labor income share. Thus, even as the primary sector has become more strongly oriented toward the rest of the world, workers in general have not seen a commensurate increase in their aggregate income in Central and Eastern Europe. On the contrary, their cumulative income has fallen. Given the conservative specification of my models and the multiple controls, this result suggests that workers in the primary sector are paid less than in the past, that they are fewer, or that, even when their wages have increased, the affected industries have destroyed so much employment that the labor income share has not been able to recover. Given the process of technological change that has transformed commodity production, the latter scenario is very plausible.

3.7 Robustness Checks

I run a number of robustness checks to evaluate the sensitivity of my findings to alternative specifications and estimation techniques. I begin by de-trending my dependent and primary independent variables to account for temporal trends. I proceed to run Prais-Winsten regressions with country dummies to further address serial correlation. Lastly, I include a number of additional controls to make sure that my results are not a product of omitted variable bias. All of these tests are discussed separately below.

3.7.1 Temporal Trends

A possible concern is that the statistically significant relationship between market income inequality, agricultural employment, and commodity production is due to the temporal trends that characterize the series. The GINI coefficient, the proportion of the employed population engaged in the agricultural sector, and the primary goods exports series exhibit a degree of serial correlation. Although they vary over time, values are path-dependent. While Driscoll-Kraay standard errors correct for temporal autoregressiveness, I resort to de-trending to further address these temporal dynamics. I regress market income inequality, agricultural employment, and commodity exports on time. I

then re-estimate my models by replacing the original series with the resulting residuals. Because these residuals have been stripped of linear temporal dependencies, my results should not be due to any shared trends.

Table 5 shows that de-trending does not change my results. Even when the linear temporal trends in my dependent and main explanatory variables are removed, commodity exports and agricultural employment levels remain statistically significant in the expected direction. A larger proportion of the labor force employed in agriculture is associated with a lower market income GINI coefficient. In contrast, rising commodity exports - agricultural, mining, or foods - are linked to growing income differentials. The robustness of these relationships in the presence of de-trending suggests that any shared underlying dynamics over time do not explain my results.

Table 3.5: De-trended Models (Eastern Europe)

	Model 19	Model 20	Model 21	Model 22	Model 23
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.407* (0.16)				
Primary goods exports		28.084** (7.26)			
Agricultural exports			90.899* (46.27)		
Foods exports				41.590* (16.54)	
Ores and metals exports					49.382* (23.09)
Industrial employment	-0.705*** (0.12)	-0.383* (0.15)	-0.280 (0.20)	-0.411* (0.14)	-0.364* (0.15)
Democracy	-16.720** (4.49)	-15.672** (4.11)	-20.565*** (4.13)	-17.351*** (3.27)	-15.619** (4.30)
Left seats	0.008* (0.00)	0.007* (0.00)	0.010** (0.00)	0.008* (0.00)	0.008* (0.00)
Capital account openness	-0.030 (0.27)	0.072 (0.24)	-0.305 (0.29)	-0.013 (0.20)	-0.266 (0.19)
Trade	-0.047* (0.02)	-0.080** (0.02)	-0.059** (0.02)	-0.070** (0.02)	-0.056* (0.02)
FDI inflows	0.012 (0.03)	-0.004 (0.03)	0.003 (0.03)	0.018 (0.03)	-0.018 (0.03)
GDP growth	0.096*** (0.02)	0.092** (0.03)	0.059* (0.03)	0.110*** (0.02)	0.082*** (0.02)
GDP per capita	3.907 (2.52)	7.817*** (0.79)	9.401*** (0.72)	8.300*** (1.13)	9.145*** (0.68)
Inflation	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Unemployment	-0.053 (0.06)	0.039 (0.05)	0.088* (0.05)	0.054 (0.04)	0.101* (0.04)
Government consumption	-0.086 (0.08)	-0.002 (0.06)	-0.074 (0.06)	0.012 (0.09)	-0.046 (0.07)
Remittances	-14.477 (13.31)	-8.458 (13.06)	-10.285 (11.01)	-15.744 (11.31)	-14.351 (11.52)
Commodity boom	0.999 (0.61)	1.156* (0.53)	1.085 (0.63)	1.172* (0.58)	1.000* (0.53)
Constant	1.284 (25.58)	-42.555** (11.09)	-60.073*** (10.67)	-47.397*** (9.99)	-58.445*** (9.06)
R-squared	0.548	0.550	0.531	0.529	0.519
N	181	179	179	179	179

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

3.7.2 Prais Winsten Regressions

The results above reveal that economic structure matters for inequality. More specifically, they show that changes in employment or trade patterns over time are associated with rising or falling market income dispersion within countries.

To answer this question, I run Prais Winsten models, which combine panel-corrected standard errors with ar1 corrections. Substantively designed to address the serial and spatial autocorrelation that characterize cross-sectional time-series data (Beck and Katz 1995 and 2011), Prais Winsten regressions account for both temporal and cross-sectional variation. They correct for first-order autoregressiveness by including a lagged dependent variable on the right hand side of the regression equation without suppressing the explanatory power of other covariates. This technique thus allows me to check whether difference among countries alter my results.¹⁰

Table 4 below presents the results from the Prais Winsten models. As it can be easily noted, once cross-sectional variation is factored into the analysis, my conclusions about the relationship between the primary sector and income inequality change. Agricultural and food exports remain positively signed and statistically significant. However, ores and metals exports come out negatively signed. This suggests that larger mining exporters are more equal. This could be because wages in the sector are relatively equal or because the revenues from mining are used to reduce income differentials.

¹⁰In another series of analyses I replicate my fixed effects models and add country dummies to account for unobservable time-invariant characteristics that I cannot control for due to data limitations. Table 2.5 in Appendix 2 shows that the results from the main analysis remain substantively unchanged. Agricultural employment is negatively signed and statistically significant. Primary goods, agricultural goods, foods, and ores exports all come out positively signed and statistically significant. This implies that the results from my fixed effects models with Driscoll-Kraay standard errors are robust to an alternative empirical technique which is similarly very conservative.

Table 3.6: Prais Winsten Regressions (Eastern Europe)

	Model 24	Model 25	Model 26	Model 27	Model 28
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.109 (0.07)				
Primary goods exports		-0.319 (7.75)			
Agricultural exports			89.764*** (25.98)		
Foods exports				36.099* (17.84)	
Ores and metals exports					-94.880*** (24.52)
Industrial employment	-0.627*** (0.10)	-0.535*** (0.10)	-0.475*** (0.09)	-0.460*** (0.09)	-0.469*** (0.08)
Democracy	20.509*** (4.48)	23.649*** (4.54)	17.683*** (4.48)	21.637*** (4.45)	18.810*** (4.18)
Left seats	0.002 (0.01)	0.002 (0.01)	0.005 (0.01)	0.001 (0.00)	0.002 (0.01)
Capital account openness	0.185 (0.30)	0.203 (0.29)	-0.101 (0.30)	0.204 (0.30)	0.443* (0.26)
Trade	-0.031* (0.01)	-0.024 (0.02)	-0.033** (0.01)	-0.042** (0.01)	-0.008 (0.01)
FDI inflows	0.002 (0.04)	0.002 (0.04)	0.003 (0.04)	0.005 (0.04)	0.023 (0.04)
GDP growth	0.102** (0.03)	0.093** (0.03)	0.071* (0.03)	0.104** (0.03)	0.102*** (0.03)
GDP per capita	5.111*** (1.37)	5.602*** (1.37)	7.480*** (1.36)	6.207*** (1.37)	4.314** (1.45)
Inflation	0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.002 (0.00)	0.003* (0.00)
Unemployment	0.018 (0.08)	0.061 (0.07)	0.056 (0.07)	0.060 (0.07)	0.077 (0.07)
Government consumption	0.295* (0.15)	0.317* (0.15)	0.357* (0.14)	0.370* (0.15)	0.242* (0.12)
Remittances	-9.672 (24.27)	-0.847 (22.06)	1.400 (20.66)	-5.929 (22.65)	8.346 (18.28)
Commodity boom	0.815* (0.48)	0.779* (0.47)	1.032* (0.48)	0.919* (0.48)	0.815* (0.44)
Constant	-3.340 (14.96)	-16.680 (12.23)	-33.123** (12.38)	-23.955* (12.33)	-1.631 (12.99)
R-squared	0.851	0.856	0.863	0.861	0.879
N	181	179	179	179	179

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

In contrast, agricultural employment and primary goods exports are no longer statistically significant. Given the robustness of the results from the fixed effects models, this might be because the cross-sectional and the over-time effects negate each other. It is

possible that countries where a high proportion of the labor force works in agriculture are not more equal than their counterparts. Sector dualism – or the breach between agriculture and industry - might be higher in these societies. Alternatively, income differentials might be lower in more industrialized countries. Furthermore, less diversified economies might have a more egalitarian income distribution. These differences point to the need of exploring cross-sectional in addition to temporal transformations.

3.7.3 Alternative Specifications

While the results presented above are robust to alternative modeling techniques, a lingering concern remains. It is possible that the relationship between the primary sector and market income inequality is sensitive to the inclusion of additional controls. To assess this possibility, I re-estimate my models with controls for the economic reform process and the level of inequality at the beginning of the transition. The former is an average of the six European Bank for Reconstruction and Development (EBRD) transition indicators – large-scale privatisation, small-scale privatisation, governance and enterprise restructuring, price liberalisation, trade and foreign exchange system, and competition policy. It captures the overall progress made by each country in reforming its economic model, with higher values corresponding to faster and deeper reforms. The latter, on the other hand, controls for initial country differences and examines whether the level of dispersion in the last year of communism shapes the subsequent trajectory of inequality in each society. Existing scholarship on inequality in Central and Eastern Europe identifies both variables as statistically significant predictors of income differentials in the region.

Table 3.7: Additional Controls (Eastern Europe)

	Model 29	Model 30	Model 31	Model 32	Model 33
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.537*** (0.13)				
Primary goods exports		35.991*** (7.20)			
Agricultural exports			41.356 (47.46)		
Foods exports				52.875*** (11.47)	
Ores and metals exports					42.633* (22.40)
Industrial employment	-0.660** (0.20)	-0.239 (0.17)	-0.270 (0.22)	-0.317 (0.19)	-0.242 (0.19)
Left seats	0.020*** (0.00)	0.014*** (0.00)	0.016** (0.00)	0.017*** (0.00)	0.016** (0.00)
Democracy	-16.542*** (3.86)	-14.497** (4.27)	-18.257*** (3.91)	-16.864*** (3.45)	-15.239*** (3.47)
EBRD reform index	3.527** (1.16)	0.690 (1.15)	1.617 (1.63)	2.051 (1.21)	1.641 (1.58)
Capital account openness	-0.284 (0.38)	-0.190 (0.39)	-0.439 (0.36)	-0.208 (0.34)	-0.568 (0.33)
Trade	-0.066** (0.02)	-0.110*** (0.02)	-0.070*** (0.02)	-0.089*** (0.02)	-0.072*** (0.02)
FDI inflows	0.029 (0.03)	0.019 (0.05)	0.032 (0.05)	0.046 (0.04)	0.008 (0.05)
GDP growth	0.095** (0.03)	0.083* (0.03)	0.052 (0.04)	0.104*** (0.03)	0.064* (0.02)
GDP per capita	-3.292 (3.01)	6.564** (1.71)	8.292** (2.23)	5.747*** (1.45)	7.787*** (1.74)
Inflation	0.000 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Unemployment	-0.156* (0.07)	0.029 (0.05)	0.062 (0.05)	0.014 (0.05)	0.086* (0.04)
Government consumption	-0.259* (0.14)	-0.035 (0.09)	-0.155 (0.10)	-0.046 (0.08)	-0.124 (0.10)
Remittances	-16.677 (16.94)	-11.150 (19.33)	-17.179 (13.01)	-18.436 (16.14)	-20.713 (16.58)
Commodity boom	1.121* (0.54)	1.480** (0.42)	1.148* (0.61)	1.425** (0.43)	1.270* (0.56)
GINI 89	3.694** (1.19)	0.138 (0.64)	-0.329 (0.76)	0.359 (0.58)	-0.303 (0.60)
R-squared					
N	146	144	144	144	144.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

The table above reveals that this is not necessarily the case. Both variables are positively signed and statistically significant in the first model, which includes agricultural

employment. This implies that faster reforms and higher income differences at the end of the communist regime are associated with higher inequality in the course of the transition. However, GINI 89 and the EBRD reform index lose their statistical significance in the primary goods exports models. In contrast, commodities, foods, and ores and metals exports remain positively signed and statistically significant. The percent of the labor force engaged in the agricultural sector is negatively signed, as expected. This suggests that these variables are robust to the inclusion of additional controls.

Taken together, then, these robustness checks largely corroborate the conclusion drawn in the main analysis. The results yielded by multiple tests reinforce each other and shed light on the possible mechanisms linking commodity exports and income inequality in post-Communist Eastern Europe

3.8 Discussion and Conclusion

This paper has sought to explore the relationship between economic inequality and economic structure in Central and Eastern Europe in the years following the region's transition to democracy and market capitalism. While existing studies have underscored the importance of structural transformations for income inequality, their emphasis has predominantly been on other aspects of economic change. Indeed, scholarship on the political economy of the transition has often focused on the process of deindustrialization, examining its effect on employment and wage polarization. Other work has discussed the impact of trade, privatization, and foreign direct investment on economic inequality. Nevertheless, much remains unknown about the implications of trade with commodities for the income distribution in the post-communist world. Although scholars have documented the importance of land reform and economic liberalization, to my knowledge, they have rarely analyzed the effect of the primary sector on economic inequality in post-communist Eastern Europe.

This focus is important because the collapse of communism in the region imposed an extensive reorganization of economic life. The disintegration of the trading bloc behind the Iron Curtain meant that commercial patterns and dependencies that had been in

force for decades suddenly found an abrupt interruption. Countries in the region thus faced the imperative of integrating into an entirely different global system of production, establishing new specializations, and rebuilding their foreign trade. This process simultaneously entailed the precipitous decline, at least initially, of the industrial sector which lay at the heart of the communist regime and the gradual transformation of the primary sector. After the implementation of comprehensive land reforms, the privatization of formerly state-owned mines, the adoption of new technologies, and the introduction of new production methods, this sector became re-inserted into the international economic system. As a result, countries in the region increased their commodity exports throughout the late 1990s and the 2000s.

How has this increase affected the income distribution in a time of intensifying economic interdependence and rapid technological change? Has trade with primary goods reduced or widened income differentials? In other words, has it had the same effect as deindustrialization, which destroyed manufacturing jobs and led to the polarization of the employment structure, or has it counteracted this effect? Does commodity production boost the income of the less well-off, or does it grant rents to the economic elites?

I show that trade with commodities has been associated with higher market income inequality in Eastern Europe after the communist transition. Although higher employment levels in the agricultural sector reduce income differentials, the proportion of the labor force engaged in this sector has been steadily declining since the beginning of the post-communist transition. In contrast, exports from the agricultural and extractive sectors have been rising. These exports, however, lead to a more inequitable income distribution. Agricultural and metallurgic exports in particular are positively correlated with a higher GINI coefficient, a higher income share for the top 20 percent of the income distribution, a lower income share for the bottom quintile, and a lower labor share. These results are not explained by shared temporal trends and remain robust to alternative specifications.

What explains the inequality-exacerbating effect of commodity exports? I argue that in the face of technological change, the sector has lost its ability to absorb labor. As agriculture and mining mechanized, their demand for workers decreased. The introduction

of new production methods also changed the type of labor that the sector needs. While in the past it employed low-skill workers, it currently also seeks high-skill professionals or cadres with technical education. Thus, the deep transformations that the primary sector has undergone in recent decades and its increasingly technologically intensive profile explain the positive impact that it has on income inequality.

This study contributes to an enduring debate in political science – how does dependence on commodities shape the market income distribution in developing countries. Examining this puzzle in the context of the post-communist transition in Central and Eastern Europe is especially illuminating because it allows a focus on a historical period marked by the internal transformation of the primary sector in an environment unencumbered by a previous experience with strong resource dependence, state capture, and external control on the primary sector. Thus, exploring the relationship between commodities and economic inequality not only answers a previously unaddressed question but also sheds light on diverse aspects of this relationship.

Future research could explore whether the different types of privatization and land reform implemented in the region have affected the relationship between commodity exports and market income inequality differently. Countries in Central and Eastern Europe did not adhere to the same path. Rather, they pursued vastly different reform strategies. Examining how these strategies have shaped the winners and losers from trade liberalization and trade with primary goods can help us gain additional insights into the interaction between domestic and international factors in affecting inequality.

Chapter 4

YOU REAP WHAT YOU SOW: COMMODITY PRODUCTION AND MARKET INCOME INEQUALITY IN LATIN AMERICA

4.1 Introduction

Latin America's dependence on commodity production has spurred a rich literature on the repercussions of natural resource endowments for the political and economic development of the region. Existing scholarship has explored the implications of these endowments for economic stability, violent conflict, democratic consolidation, elite responsiveness, partisan cleavages, market discipline, and institutional capacity (Prebisch 1950, Cardoso 1979, Rueschmeyer et al. 1992, Campello 2015, Weyland 2009, Madrid et al. 2010, Sokoloff and Engerman 2002, Ross 2004 and 2012, Dunning 2008). Although it recognizes that specialization in the production of primary goods can lessen economic constraints and mitigate class conflict during periods of rising global commodity prices (Karl 1989, Levitsky and Roberts 2013), research on the region has traditionally viewed such specialization as undermining democratic representation and accountability. Indeed, exclusive reliance on commodities not only insulates political elites from popular pressures, but also contributes to a polarized social structure through the creation of enclave economies.¹

An accompanying consequence of this process is rising market income inequality. Existing scholarship has established that natural resource abundance rarely benefits different social groups equally, especially in the absence of government action designed to redistribute resources (Van de Walle 2009). In fact, production processes often allow economic elites to capture and accumulate rents (Sokoloff and Engerman 2002). This is either be-

¹Enclave economies are industries in localized regions that show profound differences from the surrounding areas and economy.

cause ownership of the land and the capital crucial for the production of primary goods is concentrated in a small fraction of the population or because interested groups can create, control, and exploit monopolies arising from limited competition. As a result, the economic gains resulting from commodity production are typically unbalanced, favoring already well-off groups and seldom benefiting the lower classes. Specialization in the production of primary goods is therefore deemed as conducive to higher income polarization.

A competing view sees the production of commodities as suppressing market income differentials. The primary sector, or at least some activities within it, frequently creates jobs for low-skill workers who might have difficulties accessing the labor market. Rising demand for such workers has the potential to decrease the unemployment rate and bring down the educational premium (Kanbur 2015). Furthermore, the exploitation of natural resources can generate positive externalities. Commodity production might stimulate local economic activity by raising local demand and boosting local government revenues, both of which can positively affect local employment and income growth, ultimately benefiting low-income households. In this sense, specialization in primary goods might in fact alleviate market income inequality.

While the historical trajectory of Latin America seems to support the hypothesis that commodity production is associated with growing inequality, the last two decades seem more consistent with the argument that specialization in primary goods reduces income differentials. The 2000s brought about a marked decline in market income inequality across the region. Simultaneously, the early 2000s witnessed a pronounced increase in commodity production and exports in Latin America as global commodity prices rose dramatically in response to growing demand from China and other emerging markets. Crop and food production almost tripled across the region, while primary goods exports as a proportion of GDP nearly doubled in Argentina, Bolivia, Chile, and Peru. These contemporaneous developments challenge the conventional wisdom that specialization in the production of commodities should be associated with widening income differentials and raise questions about the effect of economic structure on the income distribution.

Has the relationship between natural resources and income inequality changed in Latin America in recent years?

This question remains relatively understudied in the recent literature on the subject. Existing scholarship has documented the downward reversal in income inequality following two decades of rising poverty and inequality (Lustig et al. 2010). Theoretical treatments have mainly linked this fall to political configurations and policy choices. In particular, the transition to democracy in the last decades of the twentieth century, the rise of left-wing parties in the 1990s and the early 2000s, and the expansion of access to education that took place during the last thirty years have resulted in more redistributive social policy regimes, stronger labor legislation, and a decrease in the educational premium (Huber and Stephens 2012, Levitsky and Roberts 2013, Lopez-Calva and Lustig 2010). In contrast, structural dynamics related to economic specialization have received relatively less attention. While extant work recognizes the important role that the commodity boom played in relaxing budget constraints, it has not specifically explored the direct effect that commodity production and trade have had on the income distribution (Weyland et al. 2010). Furthermore, most analyses have mostly focused on net, or post-taxes-and-transfer, income inequality, largely neglecting changes in market income. Consequently, much remains unknown about the determinants of pre-redistribution income differentials.

This paper strives to fill these gaps by exploring the relationship between natural resource endowments and market income inequality in Latin America between 1990 and 2013. My empirical analysis suggests that rising employment in the agricultural sector, increasing food and crop production, and growing primary goods exports are associated with falling market income differentials in Latin America. This is consistent with the hypothesis that the primary sector continues to absorb labor or has positive spill-over effects for the surrounding economy. This effect, however, is conditional on the inclusion of Central American countries in the analysis. Food and crop production and agricultural and fuel exports do not affect the income distribution in continental South America in a statistically significant way. In fact, foods exports are correlated with widening income

differentials and when Bolivia, Peru, and Chile are dropped from the regressions, ores and metals exports have the same impact. This suggests that the intensifying mechanization of agriculture in the region, the capital-intensive nature of mining, and the potential for rent extraction are linked to higher income inequality. These results indicate that countries in the region are subject to different dynamics and point to the need to differentially explore the structural transformations characterizing the historical trajectory of the region.

The analysis outlined above enriches our understanding of the relationship between economic structure and market income dispersion in emerging economies. It provides valuable insights that contradict the often-repeated story that specialization in the production of commodities necessarily exacerbates income differentials. It also points to the need to pay more careful attention to structural dynamics when studying income inequality. Understanding these dynamics is crucial for analyzing the implications of subsequent policy choices. This is especially true for countries whose welfare states cannot effectively reduce inequality through redistribution, which is the case of Latin America. Despite recent reforms that sought to broaden the coverage and generosity of social programs, expand access to education and health care, and enhance redistribution, countries in the region still struggle to address social deficits and alleviate income differentials. Thus, although the last decade has seen progress, welfare states in the region remain truncated or underdeveloped, which limits their ability to redistribute resources and leaves large segments of their most vulnerable populations outside of the scope of social protection schemes (World Bank 2014, Lustig et al. 2012). In this context, identifying the drivers of market income inequality becomes essential for understanding the causes of post-taxes-and-transfer income inequality.

This paper is organized in seven sections. Section one briefly reviews the prevailing explanations of income inequality in Latin America. Section two discusses the relationship between market income inequality and specialization in the production of commodities, spelling out the competing arguments linking the primary sector to the income distribution. Section three explains my methodological approach. Section four presents the

results from a number of cross-sectional time-series models estimated against two samples of 21 and 11 Latin American countries between 1990 and 2013. To my knowledge, this is the first quantitative study that explicitly tests for the impact of natural resources on market income inequality in the region. Section five includes a number of robustness checks. The final section offers some concluding observations.

4.2 Literature Review

The literature on income inequality has focused on a variety of factors that influence the evolution of income dispersion. While some models highlight the impact of economic processes and international dynamics, others emphasize the importance of domestic institutions and political actors. Existing scholarship on Latin America draws on both traditions.

One of the earliest theories about inequality links changes in the distribution of income to transformations in economic structure (Kuznets 1955, Nielsen and Alderson 1995). Industrialization initially results in higher levels of income dispersion but as economies modernize, inequality decreases. Because employees typically have similar productivity levels and unions have historically fought for wage compression, wage dispersion tends to be lower in manufacturing. Logically, then, deindustrialization has been associated with rising inequality (Thewissen et al. 2013, Bogliaccini 2013). As employment becomes concentrated in more heterogeneous sectors, the employment structure becomes more polarized. This polarization is exacerbated by the destruction of high-wage employment opportunities for low-skilled workers, which industry has traditionally provided (Rodrik 2011 and 2016).

The switch toward a more liberal economic model beginning in the 1980s has produced similar outcomes. Neoliberalism entailed the elimination of state involvement in economic matters and the privatization of previously state-owned companies. These processes significantly altered the distribution of income in Latin America (Huber and Solt 2004, Bogliaccini 2007, Levitsky and Roberts 2013). The removal of price controls and the resulting rise in utility prices hurt the poor while benefiting the rich, who gained owner-

ship of many utility companies after the reforms (Haggard and Kaufman 2008, Kaufman and Nelson 2004). The sale of public enterprises also resulted in considerable unemployment and wage dispersion (Keane and Prasad 2002, Huber and Stephens 2012). The decline of the generally more egalitarian public sector thus had important implications for inequality.

Trade and financial liberalization, which neoliberalism actively promoted, have also sparked interest in the relationship between globalization and income inequality (OECD 1994, Autor et al. 2016, Bourguignon 2015, Wood 2018). The traditional Heckscher-Ohlin model² predicts that free trade would result in specialization favoring low-skill workers, who are abundant in less-developed countries (Krugman and Obstfeld 2010, Kanbur 2015). Research on Latin America, however, highlights that trade liberalization worsened the income distribution in this region (Feenstra and Hanson 1996, Bogliaccini 2013). In many cases, this rise was due to increases in the educational premium (Wood 1995, Lustig 2010). Technology transfers and foreign direct investment from abroad accelerated the growth of capital-intensive sectors seeking qualified labor, which is scarce in the region in the 1990s.

Apart from economic processes, political factors can also affect inequality. Of particular importance is regime type. According to existing research, political competition makes ruling elites responsive to the interests of a larger constituency and enables the underprivileged to gain entry into the decision-making process (Bueno de Mesquita 2003, Huber and Stephens 2012, Garay 2017). Electoral pressures also force local officials to practice forbearance, which generates income and employment for low-income constituents (Holland 2015 and 2017). The dispersion of political power, however, does not necessarily translate into inequality-alleviating pacts. International competition can limit democratic governments' ability to enhance workers' bargaining power (Choi 2017). Furthermore, since the lower classes are frequently unable to overcome collective action problems (Keefer 2007, Huber and Stephens 2012, Garay 2017) or hold elites accountable

²The Heckscher-Ohlin model is an economic model which discusses how opening up to international trade will affect the different sectors of the economy.

(Ross 2006), democracies that do not have the institutions to enable poorer citizens to mobilize may perpetuate pre-existing socio-economic hierarchies.

This is the point of departure of power resource theory (PRT), which highlights the organizational strength of political actors and views the fight over redistribution as a struggle between social actors with opposing interests (Huber and Stephens 2001, Hicks 1999). According to this analytical framework, where labor unions and left-wing parties are strong, the political agenda, either pre- or post-taxes-and-transfers, is more egalitarian (Hicks 1999, Huber and Stephens 2001, Bradley et al. 2003). Apart from collaborating with unions, left-leaning parties also engage in market conditioning and expand social investment (Kelly 2004, 2009; Morgan and Kelly 2013). In Latin America, they increased spending on education, which led to decreases in the educational premium throughout the 2000s (Lustig 2010). The PRT has largely found empirical support in Latin America (Huber and Stephens 2012, Madrid et al. 2010, Levitsky and Roberts 2013, Segura-Ubierga 2007).

The commodity boom of the early 2000s has been credited with enabling left-wing parties to pursue more egalitarian policies. Work on the political economy of Latin America recognizes the crucial role that rising commodity prices and the accompanying natural resource rents have played in lessening budget constraints, alleviating foreign exchange shortages, and permitting deviations from market discipline (Campello 2015, Levitsky and Roberts 2013, Weyland 2009). Although Garay (2017) shows that economic conditions cannot explain the move toward more inclusive social policy regimes on their own, other work highlights the importance of the commodity boom for raising revenues, securing necessary resources, and amplifying the policy space (Murillo et al. 2011). This literature thus concludes that the improving global conditions of the 2000s allowed left-wing parties to adhere to the policy agenda traditionally pursued by the left.

This negative impact of the commodity boom on inequality contrasts with previous studies' findings that natural resource endowments are associated with higher income differentials (ElGindi 2017, Ross 2001, Gylfason and Zoega 2003). This effect can be direct as well as indirect. Specialization in the production of primary goods can undermine the

development of the more homogeneous manufacturing sector, thereby increasing wage dispersion (Bourguignon and Morrisson 1990). Or it can lead to the establishment of extractive institutions that allow rents to be captured by the economic elites (Sokoloff and Engerman 2002). In the long run, such an institutional framework undermines investment in human capital, economic development, and an egalitarian income distribution (Acemoglu et al. 2001, 2003).

The literature on inequality in Latin America has thus identified a variety of factors that shape the evolution of the income distribution. Nevertheless, recent scholarship has largely ignored the direct impact of the primary sector on the income distribution. Specifically, it has neglected to explore how dynamics in this sector affect market income inequality. This paper attempts to fill this gap.

4.3 Theoretical Framework

The primary sector plays an over-sized role in Latin America. Countries in the region derive on average 24 percent of total fiscal revenues from commodities (Sinnott et al. 2010). Total natural resource rents amount to 10 to 15% of gross domestic product in Bolivia, Chile, Peru, and Venezuela. The agricultural sector itself is responsible for approximately 18% of all jobs and contributes between 2 and 20% of GDP in Latin America (CEPAL 2018 and UNCTAD 2018). Driven by strong international demand in the early 2010s, it recovered from the global economic crisis faster than the rest of the economy and grew at an annual rate of 2.9% between 2013 and 2015 (ECLAC 2015). Furthermore, primary exports account for 55% of total exports across the region. Between 1995 and 2013, commodities exports measured as a share of GDP reached 15%. Agrifood exports alone increased at an average annual rate of 12.8%, establishing the Southern Cone as a dominant global supplier of oilseeds, oil meal, grains, meat, and sugar. Thus, the sector continues to absorb labor and generate economic activity across Latin America.

Despite this, the commodity-producing sector has undergone profound transformations in recent years. Although different countries have followed different trajectories, most Latin American economies have experienced a degree of modernization. While this

trend began decades ago – a CEPAL report from the late 1970s noted that agriculture had become increasingly reliant on technological inputs and modern equipment and had transitioned to new forms of management and employment (Comes and Perez 1979) - it accelerated noticeably in the 1990s and the 2000s. Over the course of the last years ”practically all countries of the Americas [implemented] policies aimed at promoting innovation and the incorporation of technology into agriculture” (ECLAC 2015). Striving to raise agricultural productivity and to increase the value added of their agricultural products, Latin American producers enhanced the use of GMO and zero tillage technologies and introduced information and communication technologies to improve their marketing channels (ECLAC 2015).

These transformations were partly induced by the broader economic context during this period. On the one hand, the privatization process, which had been recommended by multiple international financial institutions and required by the IMF’s structural adjustment programs, transferred previously state-owned mines and lands into private hands (Huber and Stephens 2012, Lora 2012). This change in ownership implied a different logic of operation based on profit-maximization. On the other hand, economic liberalization exposed the sector to competitive pressures from abroad and allowed foreign direct investment to flow into commodity-producing industries. Following the elimination of barriers to trade, Latin American producers faced intensifying competition with the fast-growing economies of Africa and Southeast Asia, which had greatly increased their production of primary goods (ECLAC 2015). Simultaneously, the primary sector became a notable recipient of foreign capital. Estimates from CEPAL reveal that 33% of all FDI entering South America between 2005 and 2009 went into natural resources. In 2010, this share had jumped to 43%. Taken together, these changes in ownership structure, international market pressures, and financing naturally affected commodity production in Latin America.

One of the most pronounced changes that this sector has undergone has been the decline in and transformation of agricultural employment. The last three decades have witnessed a transition away from agricultural activities and a noticeable increase in the

proportion of households engaged in salaried non-agricultural activities throughout the region (ECLAC 2015). Data from the World Bank suggests that agricultural employment as a share of total employment fell by more than 50% in Bolivia, Mexico, and Uruguay between 1990 and 2015. Other countries, especially in continental Latin America, have followed a similar, though less rapid, trend.³ This decrease is partly due to the dearth of productive employment opportunities in agriculture, the skills mismatch caused by technological advancements, or the retirement of older agricultural workers (ECLAC 2015). Indeed, the agricultural sector has become increasingly technologically-intensive, adopting more sophisticated production methods that have boosted productivity, albeit to a different extent across the region (ECLAC 2012 and 2015, author interviews with Javier Escobal, Carlos Monge, Eduardo Toche). Raw material processing and the foodstuffs industries generally use automatic plants and require little labor (Pages et al. 2009). The workers that are needed typically have high skills which enable them to work with the technology (Katz and Stumpo 2001). This mechanization has meant that the labor force engaged in the agricultural sector is much smaller and much more highly qualified than in previous decades.

The mining sector has experienced similar trends. Despite the noticeable increase in production and exports during the commodity boom, the proportion of the labor force engaged in extractive industries did not expand considerably (author interviews with Hugo Nopo, Efrain Gonzales, and Javier Escobal). This is largely because the extraction of ores and minerals in Latin America has become strongly capital-intensive (author interviews with Jaime Ruiz-Tagle, Hugo Nopo, German Alarco). The large inflows of foreign capital during the 1990s and the 2000s enabled technological transfers from abroad and contributed to the modernization of the productive process. Consequently, the sector depends on sophisticated machinery and does not demand low-skill labor past the initial construction stage (Katz and Stumpo 2001). Indeed, in contrast with the development stage, the exploitation stage relies on highly specialized professionals who manage the

³Ecuador and Argentina are the only exceptions, registering a slight increase during the period under examination.

mine, oversee its smooth operation, and coordinate its function (author interview with Nopo and Gonzales). The employment opportunities generated during this stage therefore predominantly target high-skill managers and engineers.

Such workers are relatively scarce in Latin America, which drives their wages up. While the expansion of social policies brought about substantial improvements in access to education in recent years (Pribble 2013, Huber and Stephens 2012) – the percentage of individuals ages 18 to 24 enrolled in higher education rose from 21 percent in 2000 to 40 percent in 2010 (Ferreyra 2017) – the share of workers with tertiary degrees remains low. Furthermore, despite the proliferation of higher education institutions,⁴ the quality of education offered by these universities varies tremendously. As a result, those who leave the educational system not always have the qualifications that the labor market seeks. Thus, although it fell over the last two decades, the educational premium in Latin America remains relatively high. Highly qualified cadres receive much higher salaries than low-skill workers, who are abundant in the region.

In this sense, workers in mining and agriculture tend to be more highly educated and better remunerated than a large fraction of the labor force in Latin America. A considerable proportion of them – especially those working in the extractive industries – are employed in the formal sector and receive benefits, which remain out of reach for informal sector workers. Because it generates employment opportunities for highly specialized professionals who are paid noticeably high wages, therefore,

- *Hypothesis 1: The expansion of the commodity producing sector in Latin America is associated with higher market income inequality.*

Despite these trends, the growth of the commodity producing sector still has the potential to generate economic opportunities for low-skill labor. First, the process of modernization has advanced at a different pace in different countries, sectors, and producers (ECLAC 2015). On the one hand, Latin American states exhibit considerable heterogeneity in their levels of economic development, competitiveness, educational attainment,

⁴Approximately 2300 new higher education institutions offering more than 30000 different programs have been created since the early 2000s throughout the region (Ferreyra 2017)

and production profiles. Consequently, technological transfers have not progressed at the same speed across the region. As a result, some economies have adopted sophisticated technologies while others have remained more reliant on traditional production processes. These conventional methods of production are much more labor-intensive and typically create jobs for low-skill workers. On the other hand, the degree to which different sectors and production stages are susceptible to automation and mechanization varies. While the exploitation of a developed mine requires little labor, its construction is highly labor-intensive. Furthermore, while raw material processing is automated, fruit and vegetable collection still absorbs a considerable number of workers. Lastly, while multinational corporations have invested in the adoption of new technologies, smaller local owners might not have. These differences imply that the primary sector continues to absorb labor, albeit to different extent in different countries and time periods.

Second, the growth of commodity production might have created additional employment opportunities for the poor indirectly. This could have occurred through two channels. On the one hand, extractive, processing, and agricultural industries might be subject to spillover effects, whereby economic activity generates additional economic activity. Thus, even though production is not labor-intensive, it creates employment because, in order to function, mines and agricultural estates need well-maintained infrastructure, reliable transportation, and a myriad of other services. The smooth exploitation of Peruvian mines, for example, requires drivers who transport the extracted material to major ports and commercial centers (author interview with Javier Escobal and Hugo Nopo). Coastal agriculture, moreover, creates a vibrant network of services during the high season. Thus, by virtue of occurring, commodity production generates employment for workers in the services.

On the other hand, commodity production considerably raises local government revenues. The last commodity boom contributed substantial resources to municipal and departmental coffers (author interview with Raul Asensio). Small local governments thus found themselves with previously unseen funds (author interview with Miguel Jaramillo and Javier Escobal) Facing pressures to expand spending, further strengthened by con-

ventional electoral incentives in highly fragmented party systems, local political officials greatly increased investment in public works (Munoz 2016, interview with Carlos Monge). As a result, employment in construction rose considerably at the local level. These jobs mainly targeted low-skill workers without strong employment prospects.

In sum, then, even when it is capital- and technology-intensive, the commodity producing sector has the potential to generate employment opportunities for relatively disadvantaged workers. If sufficiently large, an increase in the demand for low-skill labor can bring the educational premium down decreasing income differentials. Thus,

- *Hypothesis 2: The expansion of the commodity producing sector in Latin America is associated with lower market income inequality.*

4.4 Empirical Analysis

To assess these hypotheses, I employ cross-sectional time-series analysis of a number of Latin American countries between 1990 and 2013. I begin by including all twenty-one states in Central and South America for which data are available.⁵ A subsequent set of models concentrates more carefully on the eleven continental Latin American countries.⁶ Distinguishing between the two samples allows me to evaluate the robustness of my results to the exclusion of the Caribbean and Central America, whose historical trajectory differs substantially from the political and economic development of the rest of the region and where the relationship between income inequality and commodity production might therefore be different. Focusing on the 1990s and the 2000s allows me to examine the impact of commodity production on the income distribution during a period of economic liberalization. Although different countries pursued different policies in the 1970s and the 1980s, the 1990s brought about a movement toward economic openness. National governments dismantled barriers to trade and sought integration into the global system

⁵Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

⁶Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

of production (Huber et al. 2002, Lora 2012). While these reforms initially coincided with a fall in commodity prices, the 2000s witnessed a commodity boom with rapidly rising prices for most primary goods (Campello 2015). The temporal scope of my analysis thus captures important variation in this exogenous factor.

The dependent variable, the pre-tax-and-transfer GINI coefficient, reflects the level of market income inequality in a given year. The market income GINI index captures the overall disparity characterizing the income distribution of a nation's residents before redistribution. This focus on the entire income distribution is appropriate given my interest in structural transformations affecting the entire employment structure. Furthermore, since my argument highlights the impact of sectoral economic processes, I choose to ignore the role of government intervention through transfers and taxes at this stage of the analysis. Data are available through the Standardized World Income Inequality Database (SWIID), which homogenizes and standardizes data from various sources⁷ to enable cross-country comparability (Solt 2009). The SWIID is currently the most extensive dataset on inequality in terms of its geographical and temporal coverage, providing comparable observations for all of the countries in my sample.⁸

As illustrated by Figure 1 market income inequality exhibits substantial variation over the period under examination. Starting levels are diverse and generally high, often exceeding 0.50. Inequality began rising during the 1980s and continued increasing throughout the 1990s in most of continental Latin America. Some Central American states, such as Guatemala, Nicaragua, and El Salvador, experienced a decline in income differentials during the early 1990s, but this trend reversed around 1995. The mid-2000s brought about a substantial decrease in market inequality throughout the area. In some cases, this fall exceeded ten percentage points; in others, it was much more limited in size. The most recent data from the 2010s indicate a small increase in market inequality

⁷Such as the Luxembourg Income Survey (LIS) and the World Institute for Development Economics Research at the United Nations University.

⁸The fifth version of the dataset contains 100 separate time-series imputations for each state to account for uncertainty. Following the standard practice recommended by Solt, the dependent variable used here is the mean of the 100 imputed series. To check the robustness of my findings, I also carry out the analysis with the median, minimum, and maximum of these 100 imputed series.

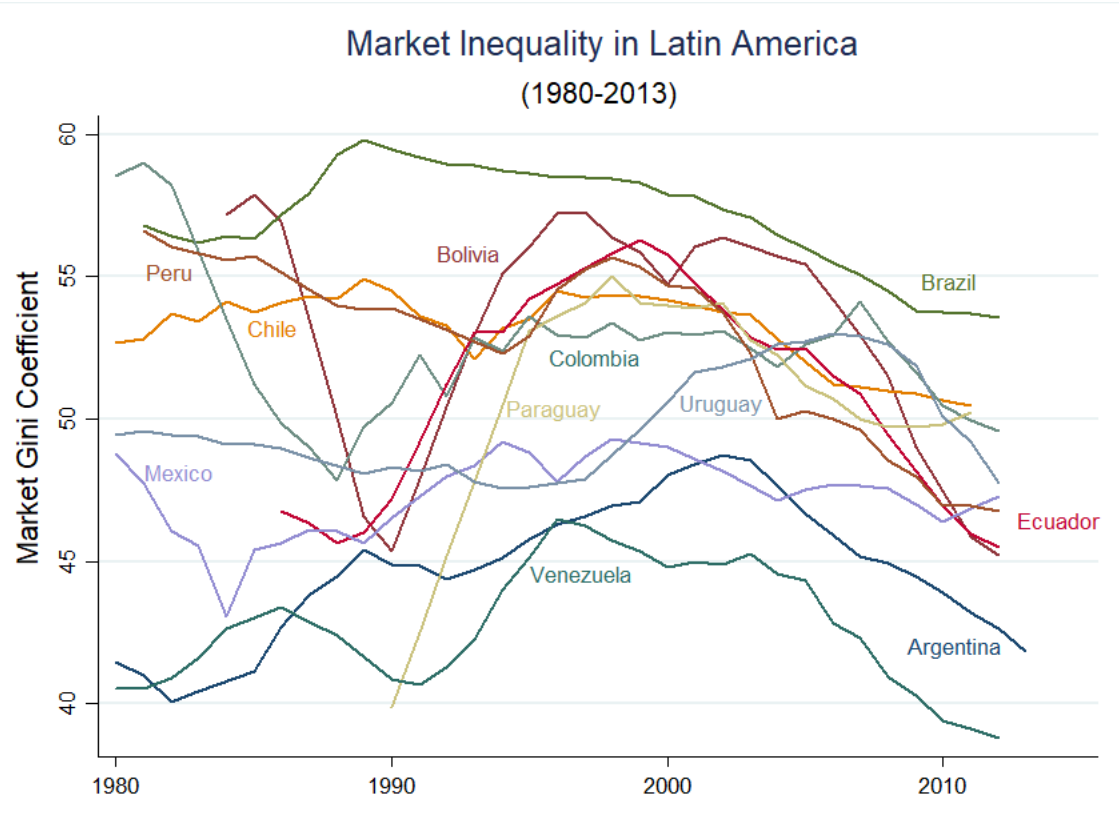


Figure 4.1: Market Income Inequality in Latin America (1980-2013)

in a number of countries.

The main independent variables capture trends in commodity employment and production. Agricultural employment reflects the proportion of total employment engaged in the agricultural sector.⁹ As figure A3.1 in the Appendix indicates, agricultural employment has followed a downward trend in most of the region in the last three decades.¹⁰ Indeed, it fell by almost 50 percent in Mexico and Chile between 1992 and 2015. Despite that, the sector remains an important source of employment in many countries. It continues to generate between ten and forty percent of all jobs in many Latin American economies, accounting for 15 percent of all employment in Brazil and, in a regional outlier, reaching 48 percent of all employment in Haiti in 2015.

⁹The agricultural sector consists of activities in agriculture, hunting, forestry, and fishing, in accordance with category A (ISIC 4).

¹⁰The only exceptions to this trend are the Dominican Republic, Ecuador, El Salvador, Guatemala, and Peru.

I further examine the impact of the commodity producing sector on the distribution of market income by focusing on primary goods exports. Primary exports reflect commodity exports as a proportion of each economy's GDP. Figure A3.3 in Appendix 3 plots this proportion through time and show that the volume of primary exports has increased in many Latin American countries between 1995 and 2013. Agricultural exports, foods exports, fuels exports, and metals and ores exports capture the main categories subsumed under commodities. Disaggregating the primary goods measure into its separate components allows me to check whether specialization in the production of different types of commodities has a differentiated effect on inequality. A series of models replacing these measures with commodity exports as a percent of total exports are presented in Appendix 3. Because exports data are not available before 1995, the temporal scope of this analysis is limited to the years between 1995 and 2013.

Not all commodities are exported, however. A fraction of the primary goods produced in a given economy is sold domestically to satisfy internal needs. To account for this, I run additional models with two production indices. Crop production captures agricultural production for each year relative to the base period 2004-2006. Similarly, food production covers food crops that are considered edible. Figure A3.2 in Appendix 3 reveals that production of crops and foods has increased substantially since the early 1990s. In some cases, such as Argentina, Bolivia, Peru, and Paraguay, crop production doubled, tripled, and even quadrupled. These experiences confirm that Latin America's economic structure remained strongly oriented toward the production of primary goods during this period.

A set of variables accounts for the effect of alternative explanations. Logged GDP per capita, inflation, GDP growth, and unemployment rates reflect changing economic conditions. Trade openness, foreign direct investment flows, and capital account liberalization capture the impact of globalization. Rural population measures the urban-rural divide. Since the public sector might alleviate market income inequality by absorbing labor, suppressing income differentials, or influencing the supply and demand for goods and services, I add government final consumption. I include remittances as a share of GDP to account for the additional income that citizens living abroad send home. Lastly, con-

sistent with existing scholarship on regime type and partisan ideology, I include V-Dem's electoral democracy index and a control for left parties' share in national legislatures. A dummy variable accounts for the period of rising commodity prices between 2003 and 2012.

Cross-sectional time-series analysis presents several substantial challenges that make the standard application of Ordinary Least Square (OLS) regression inappropriate (Hicks 1994). A fundamental assumption of OLS is that disturbances are independent from each other. In panel data, however, observations are linked in highly structured ways. Thus, pooled data produce temporally autoregressive and cross-sectionally correlated error terms, which result in biased and inconsistent parameter estimates (Hicks 1994; Huber, Huo, and Stephens 2016). To address this problem, I estimate fixed effects models with Driscoll-Kraay standard errors. Fixed effects models essentially absorb cross-sectional variation by introducing country dummies. They control for all time-invariant differences between cases, while simultaneously allowing unobserved country-characteristics to freely correlate with time-varying covariates (Bollen and Brand 2010). Fixed effects models thus focus on the temporal variation within panels. This makes them particularly appropriate for the study of the causes of change over time. Furthermore, Driscoll-Kraay standard errors (DSKEs) correct for spatial dependence (Driscoll and Kraay 1998). An alternative to traditionally used panel corrected standard errors, DKSEs are heteroscedasticity-consistent (Hoechle 2007). My model specification and estimation technique are therefore conservative, ensuring that I am subjecting my argument to a particularly difficult test.

4.5 Results

4.5.1 Larger sample

Table 1 presents the results from the statistical analysis run against the larger sample. Model 1 examines the impact of agricultural employment. Models 2 and 3 explore the effect of food and crop production. Model 4 through 8 focus on commodities exports. While Model 4 includes the broad commodity measure, models 5, 6, 7, and 8 disaggregate this measure by looking into agricultural, foods, fuels, and metals and ores exports. The

R² values yielded by the regressions indicate that the models fit the data relatively well and explain a considerable amount of variation in market income inequality.

Agricultural employment and food and crop production all return negatively-signed statistically significant coefficients. This suggests that a higher proportion of people engaged in the primary sector is associated with lower market income inequality across Central and South America. Similarly, increasing production of food stuffs and crops is related to falling market income differentials, holding the effect of all other variables constant. These impacts are substantively meaningful: the coefficient estimates indicate that a 2-standard-deviation change in agricultural employment, crop production, and food production leads to an approximately 2.208, 1.74, and 1.74 points decrease in the market income GINI coefficient.

Commodity exports – both the aggregate measure and its separate components – also come out statistically significant. Primary goods exports carry a negative coefficient, implying that rising commodities exports are associated with lower market income inequality across the region. This impact, however, differs across different categories of primary goods. Food stuffs and ores and metals exports are negatively signed, suggesting that they have the potential to bring down the GINI coefficient. As previously theorized, this might be either because the sectors continue to absorb labor and generate employment opportunities for low-skill workers or because production has spill-over effects and create additional economic activity. In contrast, higher fuels exports are correlated with widening income differentials. This lends support for the hypothesis that fuel extraction and production have become increasingly capital-intensive and can widen income differences. Agricultural exports is the only measure that fails to reach statistical significance.

The political dynamics unveiled by the statistical analysis are intriguing. Partisan ideology is consistently statistically significant. The market income distribution is more equitable in periods when left wing parties control a larger share of legislative seats. This result confirms the conclusion that left-wing parties seek to suppress income differentials even before government redistribution by conditioning the market (Morgan and Kelly 2013, Kelly 2009, Huber and Stephens 2012). This impact appears to have coun-

teracted the broader effect of the public sector. Indeed, government final consumption in Latin America exacerbates market income inequality. This might be because public sector employees in the region typically enjoy higher income, benefits, and protection levels than other workers. Or because government spending on goods and services benefits already well-off groups. Lastly, democracy does not come out as statistically significant. This might be because regime type affects the income distribution through political competition. Said differently, democracy alone is not enough to alleviate market income inequality; it influences the GINI coefficient by allowing left-wing parties to take power and pursue the policies that they favor.

Several of the economic controls included in my models also appear to shape the market income distribution. Higher foreign direct investment inflows are associated with widening income differentials. This is not surprising given the historical tendency of foreign capital to flow to capital- and technology-intensive sectors in Latin America (Huber et al. 2006, Huber and Stephens 2012, CEPAL 2015). A higher level of economic development has a similar impact – as countries become wealthier, they also become more unequal. The experience of most of the region throughout the 1980s and the 1990s is consistent with this result. In contrast, better human capital endowment, which largely reflects higher educational enrolment and attainment, is negatively correlated with the GINI coefficient. This suggests that as a larger proportion of the population gains access to education, the educational premium declines and income differentials become less pronounced. In this sense, the considerable progress that the region made in expanding access to education during the last decade has decreased income polarization in Latin America. Lastly, the statistically significant coefficient of the commodity boom dummy implies that the years between 2003 and 2013 have witnessed falling market income inequality.

Table 4.1: The primary sector and market income inequality in Latin America

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.127*** (0.02)							
Crop production index		-0.033** (0.01)						
Food production index			-0.045* (0.02)					
Primary goods exports				-6.453** (2.18)				
Agriculture exports					14.350 (12.07)			
Food exports						-22.593*** (4.11)		
Ores and metals exports							-28.476*** (5.86)	
Fuels exports								10.583** (2.82)
Electoral democracy	0.513 (1.22)	-0.529 (1.32)	-0.710 (1.29)	-2.140 (2.73)	-2.764 (2.84)	-2.476 (2.73)	-0.191 (2.25)	-2.828 (2.78)
Left legislative seats	-2.623* (1.45)	-4.975** (1.63)	-4.752** (1.57)	-5.632** (1.84)	-6.604** (2.08)	-6.436** (1.97)	-5.272** (1.68)	-7.746*** (1.93)
Capital account openness	0.514* (0.19)	0.334* (0.18)	0.384* (0.18)	0.316 (0.18)	0.309 (0.20)	0.270 (0.20)	0.272 (0.21)	0.271 (0.21)
Trade openness	0.000 (0.01)	0.006 (0.01)	0.005 (0.01)	-0.002 (0.01)	-0.009 (0.01)	-0.009 (0.01)	0.005 (0.01)	-0.014 (0.02)
FDI inflows	0.189** (0.05)	0.174** (0.05)	0.180** (0.05)	0.100** (0.04)	0.120** (0.04)	0.120** (0.04)	0.127** (0.04)	0.157** (0.04)
Economic growth	-0.002 (0.04)	0.023 (0.06)	0.012 (0.05)	0.032 (0.04)	0.025 (0.05)	0.044 (0.05)	0.017 (0.04)	0.019 (0.05)
GDP per capita	-6.791** (2.02)	-7.361** (2.01)	-6.477* (2.49)	0.170** (0.05)	0.197** (0.06)	0.150* (0.05)	0.174** (0.05)	0.214** (0.07)
Inflation	0.002** (0.00)	0.002* (0.00)	0.002* (0.00)	0.026* (0.01)	0.021 (0.01)	0.034* (0.01)	0.023 (0.01)	0.019 (0.02)
Unemployment	-0.033 (0.05)	-0.003 (0.05)	-0.013 (0.05)	0.140 (0.10)	0.139 (0.11)	0.157 (0.10)	0.143 (0.10)	0.135 (0.11)
Human capital index	-2.593 (2.10)	0.549 (1.57)	1.530 (1.50)	-6.235** (1.94)	-6.709** (1.93)	-5.136** (1.74)	-6.969** (1.76)	-6.946** (1.89)
Public sector	0.315*** (0.07)	0.300*** (0.06)	0.283*** (0.06)	0.295*** (0.07)	0.341*** (0.06)	0.324*** (0.06)	0.294*** (0.07)	0.387*** (0.07)
Rural population	-0.099 (0.07)	-0.212*** (0.05)	-0.206*** (0.05)	0.064 (0.10)	0.043 (0.11)	0.140 (0.10)	0.027 (0.10)	0.064 (0.12)
Remittances	3.238 (7.12)	4.120 (5.79)	5.056 (5.91)	-4.543 (5.28)	-3.698 (5.50)	-7.104 (6.63)	-6.083 (5.13)	-3.360 (5.81)
Commodity boom (2003-2013)	-1.082* (0.58)	-1.090* (0.53)	-0.982* (0.56)	-0.502 (0.69)	-0.691 (0.71)	-0.407 (0.69)	-0.400 (0.62)	-0.803 (0.66)
Constant	119.358*** (15.76)	122.698*** (16.13)	113.514*** (21.13)	56.269*** (5.25)	57.003*** (6.32)	52.197*** (5.17)	57.106*** (4.80)	55.916*** (6.77)
R-squared	0.411	0.396	0.389	0.507	0.501	0.528	0.527	0.512
N	398	398	398	331	331	331	331	331

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

4.5.2 Smaller sample

Restricting the analysis to continental Latin America reveals interesting differences. Table 2 below replicates the models run above excluding Central America. Limiting my sample allows me to check if the effect of commodity production and trade differs in the larger economies of Mexico and South America. Although the remaining countries differ substantially in their levels of economic development, diversification, modernization, and social structure, they are more alike in terms of their historical trajectory than the Central American states.

As it can be observed in table 2, agricultural employment remains significant while the crop and the food production indices return insignificant coefficients. A labor-intensive primary sector is associated with lower market income inequality over time, holding the impact of other variables constant. Substantively, this effect is slightly larger than the size of the impact in the bigger sample – a two-standard-deviation increase in agricultural employment is correlated with a 2.56 points drop in market income inequality. This implies that the agricultural sector is relatively homogeneous and pays similar salaries. The lack of statistical significance of the two production indices indicates that changing dynamics in the production of foods and crops are not particularly important for the distribution of market income. This might be because Continental Latin America does not specialize in these goods to the same extent as Central America does.

The commodities exports models also yield different results. As before, agricultural exports as a share of GDP fail to reach statistical significance while ores and metals exports come out negatively signed and statistically significant. In contrast, food exports are positively signed and statistically significant and the aggregate primary goods measure and the fuels exports measure return insignificant coefficients. These differences point to two possible scenarios. First, food production in continental Latin America might be more mechanized than it is in Central America. Indeed, the positive relationship between trade with foodstuffs and income inequality indicates that food exports can widen income differentials in South America. This effect is more likely in countries where food production is capital-intensive and does not absorb low-skill labor. The

mechanization hypothesis is consistent with this story. Second, the different categories of commodities might have differential impacts on the income distribution, which might negate or counteract each other more strongly in the reduced sample. This might explain why the aggregate exports variable fails to reach statistical significance.

The rest of the covariates reveal several interesting patterns. A larger proportion of legislative seats occupied by left-wing parties continues to be associated with falling income inequality. Higher levels of economic development, captured by GDP per capita, are correlated with wider income differentials. Remittances, the unemployment rate, and rural population have the same effect – all of them return positive and statistically significant coefficients. This implies that financial resources sent from abroad generally benefit better-off households, that unemployment probably affects low-skill workers more severely than highly qualified professionals, and that the rural-urban divide on the continent remains considerable. Interestingly, government final consumption fails to reach statistical significance, indicating that the state in South America does not exacerbate income inequality to the same extent that it does in Central America.

Table 4.2: The primary sector and market income inequality in continental Latin America

	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.080** (0.02)							
Crop production index		0.009 (0.01)						
Food production index			-0.021 (0.01)					
Primary goods exports				0.153 (4.26)				
Agriculture exports					-24.916 (21.00)			
Food exports						25.505** (7.22)		
Ores and metals exports							-27.539*** (4.91)	
Fuels exports								4.784 (4.20)
Electoral democracy	-0.292 (2.15)	-0.531 (2.26)	-0.571 (2.32)	-2.445 (2.07)	-2.389 (2.00)	-1.964 (1.94)	0.062 (1.83)	-2.219 (2.01)
Left legislative seats	-3.957** (1.59)	-4.780** (1.66)	-4.892** (1.67)	-6.272** (2.01)	-6.373** (1.98)	-5.585** (1.76)	-5.163** (1.60)	-6.565** (1.87)
Capital account openness	0.025 (0.17)	-0.014 (0.16)	-0.052 (0.18)	0.118 (0.15)	0.116 (0.15)	0.215* (0.11)	0.134 (0.14)	0.096 (0.16)
Trade openness	-0.016 (0.02)	-0.015 (0.02)	-0.012 (0.02)	-0.014 (0.01)	-0.004 (0.02)	-0.031 (0.02)	0.016 (0.02)	-0.017 (0.02)
FDI inflows	0.243* (0.10)	0.256* (0.10)	0.252* (0.10)	-0.047 (0.07)	-0.044 (0.07)	-0.048 (0.07)	-0.010 (0.05)	-0.022 (0.07)
Economic growth	0.040 (0.03)	0.043 (0.03)	0.049 (0.03)	0.020 (0.03)	0.018 (0.04)	0.003 (0.03)	-0.010 (0.03)	0.018 (0.03)
GDP per capita	-11.671*** (2.69)	-13.592*** (3.13)	-12.187*** (2.93)	0.070* (0.04)	0.064* (0.04)	0.085* (0.04)	0.092* (0.05)	0.058 (0.04)
Inflation	0.001* (0.00)	0.001* (0.00)	0.001* (0.00)	-0.002 (0.01)	-0.005 (0.02)	-0.013 (0.01)	0.001 (0.01)	-0.003 (0.01)
Unemployment	0.009 (0.05)	-0.008 (0.05)	-0.000 (0.05)	0.237* (0.10)	0.234* (0.10)	0.213* (0.09)	0.226* (0.10)	0.228* (0.10)
Human capital index	-4.149* (2.01)	-2.431 (2.11)	-2.224 (2.00)	-1.700 (1.68)	-1.022 (1.54)	-1.782 (1.34)	-3.604** (1.14)	-0.935 (1.53)
Public sector	0.321*** (0.08)	0.311** (0.10)	0.314** (0.09)	-0.017 (0.07)	-0.022 (0.06)	-0.082 (0.06)	-0.076 (0.05)	0.001 (0.07)
Rural population	-0.415 (0.31)	-0.320 (0.31)	-0.494 (0.34)	0.677* (0.25)	0.784** (0.24)	0.767** (0.21)	0.549* (0.24)	0.767** (0.25)
Remittances	35.873* (15.54)	42.466** (14.23)	38.192* (15.97)	27.919* (15.40)	30.285* (16.23)	38.522** (12.92)	24.878 (15.21)	27.501 (15.95)
Commodity boom (2003-2013)	-0.594 (0.55)	-0.639 (0.59)	-0.569 (0.54)	-0.351 (0.57)	-0.382 (0.56)	-0.472 (0.49)	-0.018 (0.43)	-0.335 (0.55)
Constant	176.042*** (29.40)	185.449*** (32.88)	178.986*** (29.59)	38.321** (9.80)	33.994** (9.62)	36.070*** (7.91)	43.644*** (8.14)	34.079*** (9.61)
R-squared	0.614	0.597	0.599	0.760	0.762	0.781	0.792	0.762
N	220	220	220	184	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

4.6 Distributional Consequences: Income Quintile Shares

The analysis so far suggests that patterns in agricultural employment, food production, and commodity exports affect market income inequality. But how exactly does this effect take shape? Who are the winners and losers from changing dynamics in these areas? Answering these questions requires looking at the different parts of the income distribution. While my current dependent variable, the GINI coefficient, reflects changes in aggregate inequality, it does not reveal which groups experience income gains and which witness their income decline. In contrast, a focus on the income shares of specific groups can illuminate the precise ways through which commodity exports and agricultural employment influence inequality.

To gain additional insight into the implications of commodity production for the income distribution in Latin America, I replace my outcome of interest with the income share of the richest and the poorest quintiles in society.¹¹ Tables 3 and 4 summarize the results from these analyses. To save space, I only include the models in which my main independent variables come out as statistically significant.

¹¹Data come from the Global Income and Consumption Project, which collects income, consumption, and inequality data for the 1960-2015 period.

Table 4.3: The primary sector and top / bottom income share in Latin America

	Bottom 20%	Top 20%	Top 20%	Top 20%
	b/se	b/se	b/se	b/se
Agricultural employment	0.022*	-0.060*		
	(0.01)	(0.03)		
Primary goods exports			-5.190*	
			(2.13)	
Ores and metals exports				-12.608**
				(3.62)
Redistribution	0.014	-0.673***	-0.353**	-0.334**
	(0.05)	(0.16)	(0.11)	(0.11)
Electoral democracy	0.886	-5.648*	-6.514**	-7.192**
	(0.62)	(2.01)	(1.93)	(2.18)
Left legislative seats	0.777*	-1.275	-1.742	-2.024
	(0.34)	(1.53)	(2.04)	(2.07)
Capital account openness	-0.021	-0.032	0.076	0.098
	(0.06)	(0.15)	(0.11)	(0.11)
Trade openness	-0.008***	0.019*	0.029***	0.031***
	(0.00)	(0.01)	(0.01)	(0.01)
FDI inflows	-0.033	0.161*	0.136**	0.142**
	(0.02)	(0.06)	(0.05)	(0.05)
Economic growth	-0.012	0.050	0.013	0.001
	(0.01)	(0.03)	(0.04)	(0.03)
GDP per capita	1.112	-5.114*	0.192*	0.190*
	(0.71)	(2.95)	(0.09)	(0.09)
Inflation	-0.000*	0.001*	0.022*	0.018
	(0.00)	(0.00)	(0.01)	(0.01)
Unemployment	-0.031	0.105	0.195*	0.180*
	(0.02)	(0.08)	(0.08)	(0.08)
Human capital index	0.084	-3.624	-9.116***	-9.640***
	(0.56)	(3.01)	(2.21)	(2.14)
Public sector	-0.069*	0.137	-0.093	-0.080
	(0.03)	(0.11)	(0.11)	(0.11)
Rural population	0.021	-0.347***	-0.307***	-0.327***
	(0.02)	(0.06)	(0.07)	(0.07)
Remittances	0.564	-2.358	2.624	3.579
	(1.44)	(5.66)	(5.26)	(5.31)
Commodity boom (2003-2013)	0.325**	-1.446***	-1.422***	-1.454***
	(0.10)	(0.30)	(0.35)	(0.32)
Constant	-6.958	127.830***	86.927***	88.523***
	(5.42)	(21.42)	(5.58)	(6.08)
R-squared	0.315	0.442	0.564	0.563
N	283	283	235	235

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 4.4: The primary sector and top / bottom income share in continental Latin America

	Top 20% b/se	Top 20% b/se	Top 20% b/se	Bottom 20% b/se	Top 20% b/se
Crop production index	-0.045** (0.01)				
Food production index		-0.060** (0.02)			
Agriculture exports			46.276* (25.81)		
Ores and metals exports				3.270** (1.04)	-20.352*** (2.91)
Redistribution	-0.920*** (0.14)	-0.938*** (0.16)	-0.449*** (0.10)	-0.030 (0.03)	-0.403** (0.10)
Electoral democracy	-7.333* (2.98)	-5.975* (3.18)	-2.923 (3.43)	1.205 (1.17)	-6.032* (3.04)
Left legislative seats	1.292 (1.72)	1.662 (1.47)	1.886 (1.63)	1.190* (0.56)	-0.685 (1.44)
Capital account openness	-0.472** (0.17)	-0.435* (0.18)	-0.173* (0.08)	0.008 (0.03)	-0.046 (0.08)
Trade openness	0.030* (0.01)	0.025* (0.01)	0.018 (0.03)	-0.026** (0.01)	0.069** (0.02)
FDI inflows	0.199* (0.11)	0.226* (0.12)	0.231* (0.11)	0.009 (0.02)	0.155* (0.07)
Economic growth	0.034 (0.03)	0.028 (0.03)	-0.013 (0.02)	0.017** (0.01)	-0.070** (0.02)
GDP per capita	-0.687 (2.11)	-1.997 (2.94)	-4.909* (2.34)	-0.029* (0.01)	0.109** (0.03)
Inflation	0.002** (0.00)	0.002** (0.00)	0.006 (0.01)	0.004* (0.00)	-0.004 (0.01)
Unemployment	0.056 (0.08)	0.027 (0.08)	0.024 (0.10)	-0.043 (0.03)	0.097 (0.07)
Human capital index	-10.911*** (2.15)	-8.937** (2.51)	-7.470** (2.38)	1.299** (0.39)	-9.574*** (1.87)
Public sector	0.104 (0.10)	0.119 (0.10)	-0.211* (0.11)	0.020 (0.03)	-0.267* (0.14)
Rural population	-1.342*** (0.29)	-1.353*** (0.32)	-0.199 (0.25)	-0.046 (0.07)	-0.058 (0.15)
Remittances	61.269 (56.25)	64.343 (55.43)	-15.346 (49.00)	-1.099 (14.98)	-14.809 (50.95)
Commodity boom (2003-2013)	-1.638* (0.60)	-1.480** (0.52)	-0.532* (0.28)	0.128 (0.15)	-0.704** (0.23)
Constant	128.740*** (19.80)	137.206*** (23.26)	130.848*** (19.25)	2.551 (2.75)	85.313*** (9.07)
R-squared	0.597	0.591	0.718	0.540	0.723
N	154	154	130	130	130

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Several findings stand out. First, agricultural employment seems to benefit the lowest

earning quintile and to hurt the richest 20% of the population in the larger sample. A higher number of jobs in this sector is associated with a higher income share for the bottom twenty percent and a lower income share of the top quintile. This confirms the intuition that employment in agriculture tends to generate economic opportunities for the poor.¹² Second, the effect of crops and food production is statistically significant in continental Latin America but does not seem to matter when Central America is included. The indices remain insignificant in the models run against the larger sample. In contrast, they return negatively-signed and statistically significant coefficients in the top 20 percent models using the eleven continental countries. Thus, rising output is correlated with a relatively worse income position for the richest quintile, implying that other groups benefit from specialization in the production of foods and crops. Additional analyses reveal that these groups are the second and the third quintile.

Third, the exportation of primary goods affects different economic classes differently. When the larger sample is used, the aggregate commodities exports measure comes out statistically significant in the top 20% model, suggesting that primary goods exports are associated with a lower income share for the rich. Unreported regressions reveal that this lost income is redirected toward the second and the third quintile, whose income share increases as commodity exports rise. This result is consistent with the conclusions from the main analysis, which established that a higher volume of primary goods exports is related to a lower GINI coefficient. Similarly, ores and metals exports are negatively correlated with incomes at the top. Additional models run against the income share of the second and the third quintile show that ores exports enhance the income position of these groups. No other exports measure is statistically significant in the bottom 20 percent models. Overall, then, these results lend further support for the hypothesis that primary goods exports have the potential to bring down market income inequality in Latin America.

The exclusion of Central America reveals slightly different dynamics. When the same

¹²Additional models reveal that more jobs in agriculture are linked to a higher income share for the middle classes, captured by the second and third quintile, as well.

models are run against the eleven continental Latin American states, only the ores and metals measure is revealed to be a statistically significant predictor of the income share of the bottom quintile. Rising metal exports are also associated with a lower income share for the top 20%. This implies that mining generates important spillover effects in the region. Agricultural exports, on the other hand, return a positively signed coefficient in the top quintile model. In light of the findings described above, it appears that agricultural production and trade have different effects on the income distribution. While production boosts the income position of the poor and the middle classes relative to the richest quintile, the gains from trade with agricultural goods are concentrated among the wealthy. This suggests that successful exporters in Latin America might have a different production profile, possibly absorbing less labor and using more technologically intensive production processes. None of the other exports measures comes out as statistically significant.

Lastly, the broader Latin American models indicate that redistribution is linked to a lower income share for the richest quintile. Although the variable fails to reach statistical significance in the bottom 20% models, it returns positively signed and statistically significant coefficients in the regressions run against the income share of the second and the third quintile. Redistributive efforts in Latin America therefore appear to mainly target the middle classes. This finding lends support to previous work which establishes that the welfare state in the region remains segmented and truncated and frequently neglects the most vulnerable factions of the population (Huber and Stephens 2012, Holland 2017). Nevertheless, redistributive policies do succeed in boosting the income position of the middle classes.

4.7 Robustness Checks

I run a number of robustness checks to evaluate the sensitivity of my findings to alternative specifications and estimation techniques. I begin by de-trending my dependent and primary independent variables to account for temporal trends. I proceed to run Prais Winsten regressions with country dummies to incorporate cross-country variation.

Lastly, I replace my exports shares variables with measures of trade specialization in the production of commodities. All of these tests are discussed separately below.

A) De-Trended Models

A possible concern is that the statistically significant relationship between market income inequality, agricultural employment, crop production, and commodity exports is due to the temporal trends that characterize the data. Although these variables vary over time, they do exhibit a degree of path dependence. To further correct for serial correlation, I de-trend the series by regressing them on time and using the resulting residuals to re-estimate my models. Because the residuals should be stripped of linear temporal trends, my results should not be a product of autocorrelation.

Table 4.5: Detrended models: larger sample

	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22	Model 23	Model 24
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.108*** (0.02)							
Crop production index		-0.038*** (0.01)						
Food production index			-0.060*** (0.01)					
Commodities exports			-5.627* (2.19)					
Agricultural exports					9.484 (14.65)			
Foods exports						-22.136*** (4.11)		
Ores and metals exports							-28.077*** (5.81)	
Fuels exports								12.438*** (2.53)
Electoral democracy	0.284 (1.24)	-0.456 (1.33)	-0.580 (1.31)	-2.095 (2.68)	-2.650 (2.77)	-2.338 (2.67)	-0.092 (2.20)	-2.643 (2.69)
Left legislative seats	-2.980* (1.43)	-5.069** (1.59)	-4.844** (1.51)	-5.703** (1.82)	-6.561** (2.06)	-6.375** (1.94)	-5.230** (1.66)	-7.853*** (1.91)
Capital account openness	0.478* (0.19)	0.315* (0.18)	0.373* (0.18)	0.283 (0.19)	0.277 (0.19)	0.234 (0.20)	0.239 (0.18)	0.217 (0.20)
Trade openness	0.002 (0.01)	0.008 (0.01)	0.006 (0.01)	-0.001 (0.01)	-0.007 (0.01)	-0.007 (0.01)	0.006 (0.01)	-0.013 (0.02)
FDI inflows	0.202*** (0.05)	0.173** (0.05)	0.170** (0.05)	0.110* (0.04)	0.127** (0.04)	0.128** (0.04)	0.134** (0.04)	0.173*** (0.04)
Economic growth	-0.010 (0.05)	0.023 (0.06)	0.019 (0.05)	0.027 (0.04)	0.021 (0.05)	0.040 (0.05)	0.014 (0.04)	0.013 (0.05)
GDP per capita	-6.293** (2.00)	-7.097** (1.91)	-6.128* (2.32)	0.160** (0.05)	0.183** (0.05)	0.136* (0.05)	0.160** (0.05)	0.197* (0.07)
Inflation	0.002** (0.00)	0.002* (0.00)	0.002* (0.00)	0.025* (0.01)	0.020 (0.01)	0.033* (0.01)	0.022 (0.01)	0.017 (0.02)
Unemployment	-0.041 (0.05)	0.005 (0.05)	0.008 (0.05)	0.120 (0.10)	0.118 (0.11)	0.135 (0.10)	0.123 (0.10)	0.107 (0.11)
Human capital	-0.136 (2.18)	1.375 (1.79)	1.893 (1.83)	-4.721* (2.04)	-5.142* (1.96)	-3.427* (1.86)	-5.331* (1.88)	-4.726* (1.99)
Public sector	0.332*** (0.07)	0.311*** (0.06)	0.284*** (0.05)	0.317*** (0.07)	0.357*** (0.07)	0.342*** (0.06)	0.311*** (0.07)	0.418*** (0.07)
Rural population	-0.149* (0.07)	-0.228*** (0.05)	-0.210** (0.06)	0.024 (0.10)	0.006 (0.11)	0.095 (0.10)	-0.013 (0.09)	0.011 (0.12)
Remittances	4.644 (7.35)	4.537 (5.98)	5.186 (6.08)	-4.001 (5.10)	-3.145 (5.49)	-6.625 (6.30)	-5.668 (4.90)	-2.885 (5.58)
Commodity boom (2003-2013)	-0.875 (0.60)	-1.008* (0.49)	-0.950* (0.49)	-0.342 (0.70)	-0.510 (0.71)	-0.206 (0.71)	-0.210 (0.63)	-0.553 (0.66)
Constant	62.654*** (15.70)	69.914*** (15.25)	59.475*** (19.87)	7.819 (5.45)	9.529 (6.30)	3.226 (5.32)	8.246 (4.95)	7.813 (7.03)
R-squared	0.340	0.341	0.341	0.411	0.405	0.436	0.435	0.423
N	398	398	398	331	331	331	331	331

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 4.6: Detrended models: smaller sample

	Model 25	Model 26	Model 27	Model 28	Model 29	Model 30	Model 31	Model 32
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.072** (0.02)							
Crop production index		0.006 (0.01)						
Food production index			-0.030* (0.01)					
Primary goods exports				-0.575 (4.07)				
Agriculture exports					-17.679 (18.80)			
Foods exports						24.950** (7.07)		
Fuels exports							4.248 (4.07)	
Ores and metals exports								-27.907*** (5.18)
Electoral democracy	-0.795 (2.16)	-0.989 (2.22)	-0.722 (2.27)	-2.722 (2.00)	-2.763 (2.00)	-2.274 (1.94)	-2.574 (2.01)	-0.185 (1.85)
Left legislative seats	-4.240* (1.61)	-4.998** (1.67)	-4.956** (1.69)	-6.331** (2.00)	-6.474** (1.99)	-5.713** (1.78)	-6.656** (1.87)	-5.255** (1.60)
Capital account openness	-0.040 (0.17)	-0.076 (0.17)	-0.079 (0.18)	0.072 (0.16)	0.060 (0.15)	0.165 (0.11)	0.046 (0.16)	0.089 (0.14)
Trade openness	-0.013 (0.02)	-0.013 (0.02)	-0.010 (0.02)	-0.012 (0.01)	-0.006 (0.02)	-0.030 (0.02)	-0.017 (0.02)	0.017 (0.02)
FDI inflows	0.248* (0.10)	0.259* (0.10)	0.253* (0.10)	-0.041 (0.07)	-0.034 (0.07)	-0.038 (0.07)	-0.014 (0.07)	-0.001 (0.05)
Economic growth	0.035 (0.03)	0.039 (0.03)	0.049 (0.03)	0.018 (0.04)	0.015 (0.04)	0.001 (0.03)	0.015 (0.04)	-0.012 (0.03)
GDP per capita	-11.206*** (2.72)	-12.831*** (3.08)	-11.636*** (2.85)	0.075* (0.04)	0.069* (0.04)	0.087* (0.04)	0.063 (0.04)	0.095* (0.05)
Inflation	0.002* (0.00)	0.001* (0.00)	0.001* (0.00)	-0.002 (0.01)	-0.005 (0.02)	-0.014 (0.01)	-0.004 (0.01)	0.001 (0.01)
Unemployment	0.013 (0.05)	-0.001 (0.05)	0.003 (0.05)	0.218* (0.11)	0.210* (0.10)	0.192* (0.10)	0.206* (0.11)	0.206* (0.10)
Human capital index	-2.997 (1.91)	-1.516 (1.96)	-1.824 (2.04)	-1.254 (1.70)	-0.524 (1.54)	-1.181 (1.33)	-0.364 (1.58)	-3.066* (1.13)
Public sector	0.345*** (0.09)	0.335** (0.10)	0.322** (0.09)	-0.006 (0.07)	-0.005 (0.07)	-0.067 (0.07)	0.015 (0.08)	-0.063 (0.06)
Rural population	-0.559* (0.30)	-0.478 (0.30)	-0.591* (0.31)	0.487* (0.24)	0.547* (0.24)	0.591* (0.20)	0.565* (0.24)	0.384 (0.23)
Remittances	33.999* (15.57)	39.624* (14.51)	36.399* (16.05)	26.082 (15.41)	27.711 (16.09)	36.694* (12.85)	25.787 (15.82)	23.341 (14.97)
Commodity boom (2003-2013)	-0.380 (0.53)	-0.431 (0.57)	-0.478 (0.57)	-0.213 (0.56)	-0.220 (0.54)	-0.339 (0.47)	-0.194 (0.54)	0.108 (0.43)
Constant	125.515*** (29.11)	135.593*** (32.36)	127.837*** (28.93)	-3.438 (9.80)	-6.846 (9.39)	-4.877 (7.87)	-7.283 (9.64)	-0.008 (8.07)
R-squared	0.538	0.520	0.526	0.677	0.678	0.704	0.679	0.721
N	220	220	220	184	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Tables 5 and 6 show that de-trending my series does not substantially change my results. Even when the temporal trends in my series are removed, agricultural employment, crop production, and food production remain negatively signed and statistically significant. The only exception is the crop production index in the reduced sample model, which fails to reach statistical significance. Similarly, commodity exports return coefficients which are consistent with the ones yielded by the main analysis. In the large sample models, higher primary goods exports are associated with lower market income inequality, *ceteris paribus*. Within this category, rising foods and ores and metals exports are correlated with a falling GINI coefficient while increasing fuels exports are connected with higher income differentials. As before, agricultural exports fail to reach statistical significance. In the reduced sample models, food exports are positively signed and statistically significant while ores and metals exports come out negatively signed.

B) Prais-Winsten Regressions

The results so far suggest that specialization in the production of primary goods has important implications for economic inequality. More specifically, they show that changing dynamics in agricultural employment as well as commodity production and exports over time affect the income distribution within countries. Nevertheless, my analysis does not reveal much about cross-sectional differences. Does anything change if these differences between countries are factored into the analysis?

To answer this question, I run Prais Winsten models, which combine panel-corrected standard errors with ar1 corrections. Substantively designed to address the serial and spatial autocorrelation that characterize cross-sectional time-series data (Beck and Katz 2004 and 2011), Prais Winsten regressions account for both temporal and cross-sectional variation. They correct for first-order autoregressiveness by including a lagged dependent variable on the right hand side of the regression equation without suppressing the explanatory power of other covariates. This technique thus allows me to check whether variation among panels alters my results.

Tables 7 and 8 indicate that incorporating cross-country variation substantially changes my results. First, agricultural employment and crops production fail to reach statistical

significance. This might be because within- and between- panel dynamics counteract each other. If different countries have reached different stages of modernization and move in different directions over time, the introduction of cross-country variation might negate the effect of temporal variation. Second, the exports series return coefficients which are vastly different from the ones in the main analysis. Indeed, when run against the larger sample, the Prais Winsten regressions are the mirror image of the fixed effects ones. Primary goods exports, foods exports, ores exports, and fuels exports return insignificant coefficients. In contrast, higher agricultural exports come out as positively signed and statistically significant. When Central America is excluded, intensifying specialization in ores, foods, and agricultural exports is related to widening income differentials while increasing fuels exports are linked to falling market income inequality. This might be because the largest mining countries – Bolivia, Peru, and Chile – tend to be highly unequal while the biggest oil producer – Venezuela – is one of the more equitable states in Latin America. Thus, the conclusions that these regressions lead to are different from the ones one arrives at by focusing solely on dynamics over time.

Table 4.7: Prais Winsten regressions: larger sample

	Model 33	Model 34	Model 35	Model 36	Model 37	Model 38	Model 39	Model 40
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.002 (0.002)							
Crop production index		-0.008 (0.01)						
Food production index			-0.010 (0.01)					
Primary goods exports				-1.699 (1.68)				
Agriculture exports					38.048* (15.79)			
Foods exports						-4.100 (3.36)		
Ores and metals exports							6.286 (6.42)	
Fuels exports								
Electoral democracy	5.179*** (1.30)	5.125*** (1.26)	5.053*** (1.26)	3.871* (1.56)	3.721* (1.53)	3.981* (1.57)	3.843* (1.58)	-2.532 (2.53)
Left legislative seats	-2.826* (1.15)	-2.941* (1.15)	-2.816* (1.13)	-2.564** (0.91)	-3.219*** (0.94)	-2.697** (0.93)	-2.741** (0.94)	3.783* (1.57)
Capital account openness	0.220* (0.13)	0.225* (0.13)	0.229* (0.13)	0.199 (0.13)	0.201 (0.13)	0.196 (0.13)	0.198 (0.13)	-2.539** (0.90)
Trade openness	0.010 (0.01)	0.011 (0.01)	0.011 (0.01)	0.009 (0.01)	0.007 (0.01)	0.009 (0.01)	0.007 (0.01)	0.201 (0.13)
FDI inflows	0.036 (0.03)	0.036 (0.03)	0.037 (0.03)	0.044* (0.02)	0.048* (0.02)	0.044* (0.02)	0.044* (0.02)	0.008 (0.08)
Economic growth	-0.003 (0.02)	0.001 (0.02)	-0.001 (0.02)	0.020 (0.02)	0.023 (0.02)	0.019 (0.02)	0.018 (0.02)	0.043* (0.04)
GDP per capita	-3.911*** (0.89)	-3.892*** (0.85)	-3.850*** (0.87)	-4.529*** (1.01)	-4.621*** (0.90)	-4.673*** (1.05)	-4.302*** (1.02)	0.020 (0.20)
Inflation	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.019* (0.01)	0.019* (0.01)	0.018* (0.01)	0.018* (0.01)	0.043* (0.04)
Unemployment	-0.012 (0.05)	-0.014 (0.05)	-0.015 (0.05)	-0.017 (0.05)	-0.011 (0.05)	-0.022 (0.05)	-0.012 (0.05)	-4.373*** (1.03)
Human capital index	-1.549 (1.15)	-1.361 (1.05)	-1.258 (1.07)	-1.772 (1.10)	-1.817* (0.94)	-1.968* (1.12)	-2.501* (1.07)	0.019** (0.10)
Public sector	0.119* (0.05)	0.130** (0.05)	0.127** (0.05)	0.124* (0.06)	0.186** (0.06)	0.129* (0.05)	0.146** (0.06)	0.018* (0.01)
Rural population	-0.074*** (0.01)	-0.074*** (0.01)	-0.076*** (0.01)	-0.059*** (0.02)	-0.060*** (0.01)	-0.060*** (0.02)	-0.055** (0.02)	0.018* (0.01)
Remittances	6.515 (8.34)	7.235 (8.29)	7.793 (8.62)	-7.133 (7.17)	-7.100 (6.65)	-7.005 (7.09)	-7.593 (6.83)	0.018* (0.01)
Commodity boom (2003-2013)	-0.693* (0.36)	-0.690* (0.36)	-0.669* (0.36)	-0.616* (0.27)	-0.653* (0.28)	-0.619* (0.27)	-0.642* (0.28)	0.019** (0.10)
Constant	85.862*** (8.13)	85.837*** (7.33)	85.558*** (7.47)	93.394*** (8.42)	93.360*** (7.53)	95.126*** (8.73)	92.376*** (8.46)	-1.875* (1.10)
R-squared	0.936	0.936	0.936	0.959	0.961	0.960	0.960	-2.532 (2.53)
N	398	398	398	331	331	331	331	3.783* (1.57)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 4.8: Prais Winsten regressions: smaller sample

	Model 41	Model 42	Model 43	Model 44	Model 45	Model 46	Model 47	Model 48
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.020 (0.03)							
Crop production index		-0.010 (0.01)						
Food production index			-0.018 (0.01)					
Primary goods exports								
Agriculture exports					51.896** (17.60)			
Foods exports						8.742* (4.82)		
Fuels exports							-7.417* (3.19)	
Ores and metals exports								
Left legislative seats	-2.970** (1.12)	-3.023** (1.13)	-2.934** (1.12)	-2.697** (0.94)	-2.458** (0.90)	-2.476** (0.91)	-1.905* (0.96)	8.693* (4.60)
Electoral democracy	9.202*** (1.73)	9.078*** (1.75)	9.002*** (1.72)	9.543*** (2.01)	9.015*** (1.95)	9.001*** (1.99)	8.687*** (1.96)	-2.554** (0.90)
Capital account openness	0.243* (0.13)	0.240* (0.13)	0.238* (0.13)	0.226* (0.13)	0.234* (0.12)	0.219* (0.13)	0.211* (0.12)	8.670*** (2.00)
Trade openness	-0.016 (0.01)	-0.015 (0.01)	-0.013 (0.01)	-0.010 (0.01)	-0.025* (0.01)	-0.019 (0.01)	-0.000 (0.01)	0.208* (0.12)
FDI inflows	0.112* (0.06)	0.111* (0.06)	0.117* (0.06)	0.113* (0.05)	0.112* (0.05)	0.113* (0.05)	0.104* (0.05)	-0.011 (0.01)
Economic growth	-0.023 (0.02)	-0.016 (0.02)	-0.015 (0.02)	-0.007 (0.02)	-0.004 (0.02)	-0.008 (0.02)	-0.005 (0.02)	0.088* (0.05)
GDP per capita	0.316*** (0.05)	0.311*** (0.05)	0.310*** (0.05)	0.231*** (0.04)	0.225*** (0.04)	0.240*** (0.05)	0.217*** (0.04)	-0.008 (0.05)
Inflation	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.01)	0.000 (0.01)	0.009 (0.01)	0.014 (0.01)	0.209*** (0.02)
Unemployment	0.151** (0.06)	0.152** (0.06)	0.155** (0.06)	0.143* (0.06)	0.139* (0.06)	0.136* (0.06)	0.159** (0.06)	0.009 (0.05)
Human capital index	-2.578* (1.06)	-2.155* (0.96)	-1.814* (0.95)	-3.790*** (1.06)	-3.535*** (1.02)	-4.055*** (1.03)	-4.224*** (1.06)	0.130* (0.06)
Public sector	0.093* (0.06)	0.092* (0.06)	0.105* (0.06)	0.082 (0.08)	0.085 (0.07)	0.072 (0.07)	0.058 (0.07)	-4.928*** (1.15)
Remittances	37.242* (16.98)	39.619* (16.90)	41.333* (16.70)	4.161 (14.78)	4.552 (14.96)	5.778 (15.07)	8.140 (15.33)	0.077 (0.07)
Rural population	0.091** (0.03)	0.078* (0.03)	0.078* (0.03)	0.160*** (0.03)	0.157*** (0.03)	0.146*** (0.03)	0.149*** (0.03)	5.790 (15.12)
Commodity boom (2003-2013)	-1.242* (0.50)	-1.196* (0.50)	-1.152* (0.50)	-1.065** (0.40)	-0.987* (0.40)	-1.062** (0.40)	-0.921* (0.39)	0.154*** (0.04)
Constant	38.943*** (3.46)	38.947*** (3.43)	38.609*** (3.35)	42.241*** (4.15)	42.379*** (3.98)	43.553*** (4.07)	44.374*** (4.02)	-0.998** (0.38)
R-squared	0.946	0.946	0.946	0.972	0.973	0.973	0.974	46.414*** (4.20)
N	220	220	220	184	184	184	184	0.973 184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

These differences suggest that the results obtained from cross-sectional time-series analysis are strongly sensitive to the specific empirical technique chosen to model the processes under examination. Because my focus in this project is on structural change over time, I am less interested in cross-sectional dynamics and find fixed effects models appropriate.¹³ The very different results yielded by the Prais Winsten regressions, however, show that commodity producers tend to have more inequitable distributions than economies which are less reliant on the production of primary goods. This effect apparently overwhelms the inequality-alleviating impact that rising commodity exports have over time. Thus, this economic structure is conducive to higher income differentials than one that rests on other economic activities.

C) Trade Specialization Models

To further explore the impact of commodity production on the income distribution, I replace my exports-focused independent variables with measures of trade specialization in primary goods. The United Nation Conference on Trade and Development estimates indices which reflect the normalized trade balance at the level of commodities. They are calculated by dividing the net flows of particular goods (exports minus imports) by the total flow of goods (total exports plus imports). Higher values of the index imply greater specialization in the production of these specific goods while lower values indicate higher dependence on imports from the rest of the world. To test the relationship between the production of primary goods and market income inequality, I use the trade specialization indices for non-fuel primary goods, agricultural goods, foods, fuels, and ores and metals.

As it can be observed in table 9 greater specialization in non-fuel primary goods, ores and metals, and foodstuffs is statistically significantly correlated with a lower market income GINI coefficient across the twenty-one Latin American states included in my larger sample. These results therefore confirm the findings from the exports measures. Trade specialization in agricultural products and fuels, in contrast, fail to reach statistical significance. When Central America is dropped from the analysis, however, the picture

¹³Prais Winsten regressions with country fixed effects render results largely similar to the ones yielded by the fixed effects models in the main body of the manuscript.

changes dramatically. Specialization in the production of agricultural goods returns a negatively signed and statistically significant coefficient while specialization in foods and ores comes out as positively signed. This implies that rising reliance on these exports is associated with widening income differentials. It might be that, once a particular level of specialization is reached, foods and ores production cease to generate employment opportunities for the poor, become increasingly technology-intensive, and reward high-skill professionals more than low-skill workers. This effect might take place once an economy reaches a particular level of development, as the exclusion of the less economically advanced Central American states indicates.

Table 4.9: Trade specialization models: large sample

	Model 49	Model 50	Model 51	Model 52	Model 53
	b/se	b/se	b/se	b/se	b/se
Trade specialization in primary goods	-2.397** (0.68)				
Trade specialization in agricultural materials		-0.908 (0.71)			
Trade specialization in food			-1.746* (0.62)		
Trade specialization in fuels				0.612 (0.64)	
Trade specialization in ores and metals					-1.175* (0.66)
Left legislative seats	-6.321** (2.00)	-6.442** (1.98)	-6.674** (2.05)	-6.739** (2.03)	-6.799** (2.11)
Electoral democracy	-2.104 (2.70)	-2.731 (2.82)	-2.401 (2.73)	-2.948 (2.85)	-3.450 (3.01)
Capital account openness	0.310 (0.20)	0.354 (0.22)	0.312 (0.20)	0.295 (0.20)	0.307 (0.21)
Trade openness	-0.008 (0.01)	-0.012 (0.01)	-0.008 (0.01)	-0.008 (0.01)	-0.010 (0.01)
FDI inflows	0.113* (0.04)	0.126** (0.04)	0.110* (0.04)	0.125** (0.04)	0.132** (0.04)
Economic growth	0.045 (0.04)	0.027 (0.04)	0.041 (0.04)	0.022 (0.05)	0.022 (0.05)
GDP per capita	0.142* (0.05)	0.184** (0.05)	0.158** (0.05)	0.199** (0.06)	0.169** (0.05)
Inflation	0.028* (0.01)	0.021 (0.01)	0.027* (0.01)	0.019 (0.01)	0.021 (0.01)
Unemployment	0.182* (0.10)	0.139 (0.10)	0.170 (0.10)	0.125 (0.10)	0.136 (0.10)
Human capital index	-5.947** (1.96)	-6.295** (1.83)	-6.005** (1.89)	-7.060** (1.99)	-6.017** (1.83)
Public sector	0.335*** (0.06)	0.335*** (0.07)	0.342*** (0.06)	0.352*** (0.06)	0.335*** (0.07)
Remittances	-6.581 (6.50)	-2.206 (5.55)	-6.076 (6.41)	-3.962 (5.04)	-2.309 (4.94)
Rural population	0.086 (0.11)	0.078 (0.11)	0.077 (0.12)	0.049 (0.12)	0.055 (0.11)
Commodity boom (2003-2013)	-0.534 (0.69)	-0.699 (0.71)	-0.606 (0.71)	-0.667 (0.72)	-0.559 (0.71)
Constant	54.853*** (5.30)	55.260*** (5.22)	54.948*** (5.75)	57.853*** (6.55)	56.223*** (6.04)
R-squared	0.511	0.504	0.507	0.502	0.507
N	331	331	331	331	331

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table 4.10: Trade specialization models: smaller sample

	Model 54	Model 55	Model 56	Model 57	Model 58
	b/se	b/se	b/se	b/se	b/se
Trade specialization in primary goods	1.680 (1.05)				
Trade specialization in agricultural goods		-1.503* (0.79)			
Trade specialization in foods			1.543* (0.72)		
Trade specialization in fuels				0.591 (0.57)	
Trade specialization in ores and metals					1.988** (0.68)
Left legislative seats	-6.063** (1.82)	-6.111** (1.78)	-5.921** (1.85)	-6.279** (1.83)	-6.029** (1.85)
Electoral democracy	-2.442 (2.08)	-2.662 (2.03)	-2.398 (2.13)	-2.548 (2.03)	-1.516 (2.24)
Capital account openness	0.120 (0.15)	0.180 (0.14)	0.110 (0.15)	0.090 (0.16)	0.096 (0.13)
Trade openness	-0.019 (0.02)	-0.009 (0.02)	-0.014 (0.02)	-0.016 (0.02)	-0.018 (0.02)
FDI inflows	-0.033 (0.07)	-0.027 (0.07)	-0.026 (0.07)	-0.038 (0.07)	-0.046 (0.07)
Economic growth	0.010 (0.03)	0.023 (0.03)	0.009 (0.03)	0.018 (0.03)	0.028 (0.03)
GDP per capita	0.084* (0.04)	0.044 (0.04)	0.084* (0.04)	0.066 (0.04)	0.095* (0.04)
Inflation	-0.007 (0.01)	-0.003 (0.01)	-0.008 (0.01)	-0.003 (0.01)	-0.002 (0.02)
Unemployment	0.204* (0.10)	0.270** (0.09)	0.211* (0.10)	0.220* (0.10)	0.225* (0.09)
Human capital index	-1.043 (1.36)	-0.450 (1.39)	-1.297 (1.39)	-2.011 (1.68)	-2.012* (1.05)
Public sector	-0.040 (0.07)	-0.012 (0.06)	-0.044 (0.06)	-0.007 (0.07)	-0.020 (0.05)
Remittances	33.992* (17.74)	29.856* (15.37)	33.970* (15.34)	27.021 (16.36)	33.457* (17.38)
Rural population	0.780* (0.28)	0.784** (0.25)	0.774** (0.23)	0.677* (0.27)	0.738* (0.27)
Commodity boom (2003-2013)	-0.416 (0.51)	-0.343 (0.53)	-0.395 (0.50)	-0.287 (0.55)	-0.517 (0.54)
Constant	34.019** (10.36)	32.994** (8.62)	34.617** (9.15)	39.266** (10.56)	36.331*** (9.00)
R-squared	0.764	0.765	0.765	0.762	0.770
N	184	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

4.8 Conclusion

The last two decades have witnessed important transformations across Latin America. Following the stagnation of the 1980s and the volatility of the 1990s, the 2000s brought sustained growth, rising incomes, better living standards, decreasing poverty, and falling income inequality. By the mid-2010s, the region was wealthier, more developed, and less unequal. Existing scholarship has attributed at least part of this success to the commodity boom that started in the early 2000s and saw demand for Latin American primary goods skyrocket globally. Across South America, governments of different stripes and ideology used rising revenues to redefine social policies, expand access to public services, and invest in public works (Weyland et al. 2010, Levitsky and Roberts 2013). In some countries, the commodity boom led to a radical departure from previous policy equilibria in an increasingly statist direction (Campello 2015). Thus, extant work has linked the decrease in post-taxes-and-transfer income inequality that the region witnessed to its specialization in the production of primary goods, which enabled redistribution during the period of rising commodity prices of the early 2000s.

Another way through which this specialization affects the income distribution in Latin America, however, has remained relatively underexplored. The production of commodities can shape dynamics in market income inequality directly by creating specific employment opportunities, generating spill-over effects, enabling elites to accumulate rents, or increasing the breach between different types of workers. My analysis suggests that rising food and crop production and primary goods exports are associated with falling income differentials in the twenty-one Latin American states for which data are available. This finding suggests that the primary sector continues to absorb labor and has the potential to generate positive externalities in the region. Important intra-regional differences remain, however. Commodity production does not appear to be meaningfully correlated with market income inequality in continental Latin America. In fact, increasing foods exports in these countries are linked to widening income differentials.

These results point to the need to incorporate structural transformations into the study of the determinants of market income inequality in Latin America. Although the

region has undergone important transformations over the last three decades, it remains strongly reliant on the production of commodities. The primary sector plays an oversized role in many Latin American economies, accounting for an important proportion of total economic activity and attracting substantial foreign capital. Primary goods exports comprised approximately 70% of all Bolivian and Peruvian exports between 1995 and 2015, for example. Similarly, they amounted to about 23% of Chilean GDP in the same period (UNCTAD 2016). Neglecting to account for this sector therefore poses the risk of ignoring meaningful dynamics that may affect the distribution of income.

Furthermore, my analysis reveals that it is imperative to recognize the enormous heterogeneity that continues to characterize Latin America. Indeed, the different results that one reaches when Central America is excluded from the analysis indicate that structural dynamics play out differently in continental Latin America. This might be because South American countries have reached a higher level of economic development and thus have adopted and implemented different production processes. Or it might be that Central American states have a comparative advantage in more labor-intensive sub-sectors while continental economies are better at other industries. In any case, acknowledging these differences prevents generalizations that might mischaracterize the relationship between natural resources and the market income distribution.

Further work is necessary to explain existing differences and to explore the specific ways through which specialization in the production of primary goods, reinsertion into the global economic system, and income inequality interact with each other. This paper has striven to promote the analysis of these topics by empirically investigating a relationship that remains understudied. The study of this relationship becomes increasingly important as scholars and policymakers have raised questions about the political and distributional outcomes of globalization in both the developed world and the global periphery.

Chapter 5

CONCLUSION

This project has attempted to answer a broad question. How do structural transformations related to deindustrialization, the expansion of the services sector, and the growth of the commodity-producing sector affect the income distribution in Latin America and Eastern Europe? Chapters 1, 2, and 3 reveal that these processes have a meaningful impact on market, or pre-taxes-and-transfers, income inequality. This effect depends on each economy's human capital endowments, on the type of primary goods that it specializes in, and on the ability of different commodities to contribute resources to governments' coffers.

Consistent with the literature in political economy, a growing industrial sector has the potential to reduce wage dispersion by employing low-skill labor and by paying higher wages. Nevertheless, the changing profile of manufacturing in an increasingly globalized and technologically intensive world suggests that the relationship between inequality and industrialization might be changing. Indeed, this is the conclusion reached by chapter 1. My results indicate that a growing industrial sector can alleviate inequality in societies with an educated labor force and high human capital endowments, such as the post-communist societies of East-Central Europe. In contrast, where medium and high-skill labor is scarce, like in Latin America, the growth of a technologically-intensive industrial sector is associated with rising income differentials. This finding sheds light on recent developments in both the advanced industrialized world and the global periphery and highlights the importance of an effective educational policy.

Dynamics in commodity production also reveal interesting patterns. Although agriculture and extractive industries used to absorb labor, recent decades have witnessed the

modernization of these sectors. As a result, their capacity to create employment and the profile of the workers they seek have changed. While some industries, such as fruit and vegetable production, remain labor-intensive, others, such as mining and soy-bean production, have become strongly automated and mechanized. Consequently, low-skill workers no longer benefit from the expansion of the latter. Instead, large land and mine owners and high-skill professionals with a technical education earn high wages and substantial capital gains.

Nevertheless, the growth of the commodity producing sector can still have positive spillover effects for low-skill workers. In contexts characterized by high political competition, revenues from the sale of primary goods can enable policymakers to increase investment in public works. This investment can raise demand for low-skill labor, providing workers with stable (in the short run) wages and employment. It can also contribute to economic growth, spurring economic activity and bringing income gains. In this way, even though its own employment needs might not benefit low-income poorly-educated workers, the commodity-producing sector can have an indirect positive effect on this group.

This conclusion raises several important questions. First, what is attainable or feasible in an increasingly interconnected world? What policy tools are available to policymakers? How has governments' room for maneuver changed in the past several decades? Many policymakers and policy experts revealed that they were cognizant of the deep structural imbalances that underlie their economies. Nevertheless, they expressed a concern that, had they been to undertake structural reforms, they would have jeopardized their countries' growth. Respondents argued that, in a context of capital mobility, more stringent labor legislation would lead to capital flight. Foreign investors would take their resources to more business-friendly jurisdictions in an attempt to maximize profits. Decision-makers worried that, given their economies' dependence on investment, both external and internal, such a flight would result in an economic downturn, bringing negative income growth and rapidly rising unemployment. Even if incorrect, this assumption seems to have deterred deviations from the status quo.

But what does the persistence of this status quo imply? The adoption of neoliberalism often occurred under extraordinary circumstances. Many Latin American countries implemented the neoliberal program under authoritarianism, when highly repressive military governments dominated the political scene. Eastern European states pursued these reforms in the context of the severe recession unleashed by the collapse of communism. While they proved successful at eventually accelerating economic recovery and spurring growth, these programs came at a high human cost. They were followed by spikes in unemployment, considerable increases in poverty and inequality, and noticeable declines in living standards, especially among low-income citizens. These effects have caused social unrest in Latin America and have led to the collapse of the democratic governments that implemented neoliberal reforms in Eastern Europe. Yet, with few alterations, their core economic logic has not been altered despite the democratic transitions and economic stabilization that the countries that adopted them have since undergone.

This persistence has important implications for democracy. Democratic political regimes traditionally rest on the principles of accountability, representation, and participation. Economic policy has historically been a highly salient issue area with the potential to shape the political arena by giving rise to important and durable cleavages (Lipset and Rokkan 1967). If political parties have largely lost their distinctive programmatic character and become practically indistinguishable from each other in terms of the economic policies that they pursue, representation might be weakened. Furthermore, if voters are unable to effectively punish the parties that renege on their platforms and promises by selecting other viable alternatives, accountability might be compromised. This is also true if the same technocratic elite remains in place despite changes in the composition of government. As the recent political experience of Latin America, Eastern Europe, and some advanced democracies indicates, this might lead to the demise of political parties, the collapse of entire party systems, the disillusionment of the electorate, the emergence of new, anti-systemic actors, and the retreat of citizens from political life (Lupu 2014, Roberts 2013 and 2014). And if citizens withdraw from political participation, if parties grow distant from their traditional constituencies, and if political elites

delegate their decision-making power to a technocratic elite that caters to the interests of a business elite, what conclusions can one draw about the quality of democracy in these countries?

APPENDIX TO CHAPTER 1

Table A.1.1: Correlation Matrix (Eastern Europe)

	GINI	IND	KAL	TRA	FDI	GRW	GDP	INFL	UNEM	EMPL	HCAP	PUBL	REM	RURP	LEFT	DEM	NRRE
BOOM																	
GINI	1.00																
IND	-0.44	1.00															
KAL	0.39	-0.17	1.00														
TRA	0.20	0.13	0.58	1.00													
FDI	0.03	0.09	0.14	0.14	1.00												
GRW	0.27	-0.13	0.13	0.11	0.30	1.00											
GDP	0.35	0.16	0.54	0.60	-0.01	-0.00	1.00										
INFL	-0.12	0.07	-0.29	-0.19	-0.14	-0.17	-0.34	1.00									
UNEM	0.13	-0.31	-0.24	-0.07	0.01	-0.01	-0.39	0.04	1.00								
EMPL	-0.13	0.32	0.13	0.06	-0.16	-0.01	0.19	0.02	-0.58	1.00							
HCAP	0.13	0.37	0.44	0.65	0.13	-0.04	0.82	-0.31	-0.23	0.19	1.00						
PUBL	0.32	0.13	0.09	0.04	0.02	-0.07	-0.02	-0.23	0.17	-0.19	-0.04	1.00					
REM	0.09	-0.39	0.11	0.11	0.11	0.00	0.14	-0.11	0.27	-0.40	-0.09	-0.06	1.00				
RURP	-0.18	0.04	-0.35	-0.18	-0.25	-0.03	0.04	0.11	-0.02	-0.01	-0.01	-0.2433	-0.1443	1.00			
LEFT	-0.06	-0.01	-0.10	-0.04	-0.11	0.03	-0.03	0.07	-0.10	0.01	-0.09	-0.13	-0.21	0.23	1.00		
DEM	0.49	0.04	0.41	0.26	0.06	0.12	0.39	-0.29	-0.01	0.17	0.39	0.31	-0.02	-0.39	-0.16	1.00	
NRRE	-0.35	-0.29	-0.20	-0.38	-0.02	-0.03	-0.54	0.29	-0.04	0.09	-0.48	-0.39	-0.03	-0.02	0.11	-0.41	1.00

Table A1.2: Correlation Matrix (Latin America)

	GINI	IND	KAL	TRA	FDI	GRW	GDP	INFL	UNEM	EMPL	HCAP	PUBL	REM	RURP	LEFT	DEM	NRRE
BOOM	1.00																
GINI	1.00																
IND	-0.38	1.00															
KAL	-0.05	0.09	1.00														
TRA	-0.15	-0.12	0.20	1.00													
FDI	-0.05	-0.03	0.25	0.33	1.00												
GRW	-0.08	0.21	0.19	0.13	0.20	1.00											
GDP	-0.34	0.31	-0.14	-0.14	0.20	0.08	1.00										
INFL	0.14	0.03	-0.12	-0.11	-0.07	-0.12	-0.03	1.00									
UNEM	-0.19	-0.15	-0.16	0.17	0.06	-0.09	0.18	-0.04	1.00								
EMPL	0.15	-0.15	0.11	-0.04	0.20	0.01	0.02	0.01	-0.47	1.00							
HCAP	-0.25	0.21	0.22	0.30	0.50	0.24	0.66	-0.07	0.20	0.05	1.00						
PUBL	0.01	-0.05	-0.18	0.22	-0.15	-0.19	0.18	-0.03	0.19	-0.20	0.18	1.00					
REM	0.01	-0.34	0.35	0.24	0.13	0.02	-0.58	-0.06	-0.03	0.02	-0.24	-0.15	1.00				
RURP	-0.07	-0.01	-0.01	0.44	0.04	-0.07	-0.37	-0.02	0.08	-0.05	-0.21	0.10	0.21	1.00			
LEFT	-0.38	0.14	0.15	0.23	0.21	0.03	0.22	0.01	0.29	0.03	0.22	-0.04	0.13	0.27	1.00		
DEM	-0.06	0.22	0.21	-0.10	0.19	0.22	0.52	0.03	-0.03	-0.17	0.52	0.00	-0.12	-0.37	0.31	1.00	
NRRE	-0.33	0.37	-0.04	0.17	-0.04	0.02	0.14	0.01	-0.01	-0.15	0.23	0.23	-0.18	0.11	0.16	0.06	1.00

5.1 Median, Minimum, and Maximum Market Income Inequality Models

To ensure that my results do not depend on the specific way in which I handle the SWIID data, I re-ran my models using the median, the minimum, and the maximum values of the 100 multiply imputed datasets. These statistics are highly correlated in both regions. The mean and the median series are correlated at the 0.99 level. Furthermore, the minimum and the maximum of the series are correlated at the 0.67 level in Latin America and at the 0.75 level in Central and Eastern Europe. Tables 11 and 12 reveal that using these series instead of the mean market income GINI coefficient does not significantly change the results. The coefficients attached to the two primary independent variables in my analysis remain statistically significant in the expected direction.

Table A1.3: Median, minimum, and maximum market income inequality models (EE)

	Median b/se	Median b/se	Minimum b/se	Minimum b/se	Maximum b/se	Maximum b/se
Industrial Employment	-0.530*** (0.13)		-0.452** (0.13)		-0.584** (0.17)	
Service Employment		0.434** (0.12)		0.429** (0.13)		0.444** (0.14)
Capital Openness	0.089 (0.29)	0.056 (0.32)	-0.024 (0.28)	-0.031 (0.26)	0.435 (0.39)	0.386 (0.44)
Trade Openness	-0.030 (0.02)	-0.028 (0.02)	-0.039* (0.02)	-0.040 (0.02)	-0.018 (0.02)	-0.015 (0.02)
FDI Inflows	0.000 (0.02)	-0.002 (0.02)	0.044 (0.03)	0.044 (0.03)	-0.030 (0.04)	-0.034 (0.05)
GDP per capita Growth	0.025 (0.03)	0.064* (0.04)	0.028 (0.04)	0.069 (0.05)	-0.048 (0.03)	-0.009 (0.03)
GDP per capita	10.952*** (1.33)	4.154 (2.65)	3.480* (2.00)	-3.391 (2.25)	18.234*** (1.82)	11.377** (3.38)
Inflation	-0.000 (0.00)	0.000 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002* (0.00)	-0.002 (0.00)
Unemployment	-0.099 (0.10)	0.025 (0.11)	-0.064 (0.14)	0.031 (0.14)	-0.175 (0.11)	-0.033 (0.12)
Employment Level	-0.262* (0.13)	-0.011 (0.10)	-0.162 (0.18)	0.078 (0.16)	-0.397** (0.11)	-0.136 (0.11)
Human Capital	-16.272*** (2.99)	-11.034** (3.61)	-10.639* (3.74)	-5.822 (4.19)	-23.428*** (4.83)	-17.864** (5.29)
Public Sector	-0.199** (0.07)	-0.132* (0.05)	-0.281* (0.11)	-0.231** (0.08)	-0.183 (0.11)	-0.105 (0.11)
Remittances	0.637 (13.47)	-10.856 (12.83)	59.353*** (12.97)	49.942*** (12.71)	-24.188 (23.33)	-37.077 (23.29)
Rural Population	0.127 (0.15)	0.314* (0.15)	0.653* (0.29)	0.829** (0.28)	-0.266* (0.13)	-0.069 (0.13)
Left Legislation	0.007* (0.00)	0.010* (0.00)	0.007 (0.00)	0.009* (0.00)	0.012*** (0.00)	0.014** (0.00)
Democracy	-17.317** (4.94)	-18.754*** (4.52)	-1.349 (6.76)	-2.913 (6.59)	-39.161*** (8.53)	-40.546*** (7.93)
Natural Resource Rent	-0.069 (0.28)	-0.080 (0.37)	-0.012 (0.42)	-0.039 (0.47)	0.085 (0.37)	0.084 (0.48)
Boom (2003-2013)	0.804 (0.55)	1.005* (0.55)	1.550*** (0.40)	1.761*** (0.41)	-0.397 (0.61)	-0.198 (0.58)
Constant	36.863* (18.99)	24.203 (25.03)	49.462* (21.98)	43.601 (28.59)	32.992* (18.90)	16.148 (25.01)
R-squared	0.495	0.478	0.390	0.390	0.585	0.571
N	181	181	181	181	181	181

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table A1.4: Median, minimum, and maximum market income inequality models (LA)

	Median b/se	Median b/se	Minimum b/se	Minimum b/se	Maximum b/se	Maximum b/se
Industrial Employment	0.165* (0.06)		0.163* (0.08)		0.225*** (0.06)	
Service Employment		0.197*** (0.03)		0.181*** (0.03)		0.218*** (0.03)
Capital Openness	0.450* (0.22)	0.574** (0.17)	0.537* (0.24)	0.651** (0.21)	0.257 (0.23)	0.394* (0.18)
Left Legislature	-2.317* (0.90)	-1.818* (0.74)	-2.247** (0.75)	-1.794* (0.83)	-3.251* (1.52)	-2.726* (1.28)
Democracy	2.115 (1.54)	1.853 (1.27)	3.384* (1.25)	3.104* (1.19)	0.100 (2.13)	-0.348 (1.89)
Trade Openness	-0.008 (0.01)	-0.006 (0.01)	-0.015 (0.01)	-0.013 (0.01)	0.001 (0.02)	0.004 (0.02)
FDI Inflows	0.246*** (0.05)	0.226*** (0.05)	0.217*** (0.05)	0.199** (0.05)	0.243*** (0.06)	0.224** (0.06)
GDP per capita Growth	-0.021 (0.05)	-0.002 (0.04)	-0.018 (0.05)	-0.000 (0.05)	-0.031 (0.04)	-0.008 (0.04)
GDP per capita	-5.425** (1.81)	-7.130** (2.29)	-9.301*** (2.24)	-10.921*** (2.31)	-0.347 (2.27)	-2.440 (3.29)
Inflation	0.001* (0.00)	0.002* (0.00)	0.001* (0.00)	0.002* (0.00)	0.001* (0.00)	0.002* (0.00)
Unemployment	-0.002 (0.07)	-0.053 (0.07)	0.065 (0.07)	0.015 (0.06)	-0.031 (0.09)	-0.096 (0.09)
Employment Level	-0.068 (0.04)	-0.012 (0.03)	0.051 (0.04)	0.101* (0.04)	-0.193*** (0.04)	-0.134** (0.04)
Human Capital	-2.665 (2.82)	-2.616 (2.58)	0.792 (3.58)	0.904 (3.29)	-7.647*** (1.86)	-7.328*** (1.48)
Public Sector	0.278** (0.08)	0.258** (0.07)	0.237** (0.08)	0.215** (0.06)	0.369** (0.12)	0.332** (0.11)
Remittances	4.984 (6.36)	3.220 (6.01)	15.704 (9.30)	14.037 (9.07)	-9.663 (6.21)	-11.789* (5.51)
Rural Population	-0.126* (0.05)	-0.020 (0.08)	-0.292*** (0.06)	-0.193** (0.06)	0.032 (0.09)	0.156 (0.14)
Natural Resource Rent	0.025 (0.05)	0.045 (0.04)	0.073 (0.05)	0.091* (0.04)	-0.054 (0.09)	-0.035 (0.08)
Boom (2003-2013)	-0.950 (0.66)	-1.093* (0.58)	-1.192 (0.69)	-1.328* (0.61)	-0.426 (0.61)	-0.605 (0.55)
Constant	106.015*** (15.69)	106.740*** (20.92)	127.992*** (20.75)	129.283*** (21.25)	76.525** (21.17)	79.827* (32.49)
R-squared	0.379	0.411	0.354	0.378	0.458	0.476
N	398	398	398	398	398	399

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5.1.1 Jackknife Models

Lastly, I resort to jackknifing in order to check whether my results capture dynamics common to all countries in my sample. Jackknife resampling is a statistical technique which allows researchers to assess the sensitivity of their results to the exclusion of particular countries from their analysis. It does that by taking the original data vector and deleting one observation from the set. Researchers thus end up with n jackknife samples on which they can evaluate their hypotheses.

Because I am interested in the sensitivity of my results to the exclusion of different countries, I apply jackknife resampling by dropping countries, rather than country-years, which are the unit of my analysis, from my dataset. My models are thus run against 10 different combinations of Eastern European states and 20 combinations of Latin American countries.

The results, reported below, reveal some interesting dynamics. Industrial and service sector employment levels keep their signs. Nevertheless, it appears that developments in the two sectors are not equally meaningful in all countries in the two regions. Service sector employment shares are no longer statistically significant in Central and Eastern Europe. Similarly, industrial employment levels fail to reach statistical significance in Latin America. This indicates that the expansion or contraction of these sectors are not equally important for market income inequality in all countries in the two regions. This might be because the size of these sectors differ across states or because their development over time is not as dynamic and, therefore, important, in some countries as it is in others.

Table A1.5: Jackknife Resampling Results

	CEE Industry	CEE Services	LA Industry	LA Services
	b/se	b/se	b/se	b/se
Industrial Employment	-0.526*		0.171	
	(0.19)		(0.11)	
Services Employment		0.439		0.198**
		(0.25)		(0.07)
Capital Openness	0.120	0.091	0.432	0.557*
	(0.83)	(0.74)	(0.35)	(0.29)
Trade Openness	-0.030	-0.029	-0.008	-0.005
	(0.02)	(0.03)	(0.03)	(0.03)
FDI Inflows	-0.001	-0.003	0.243	0.223
	(0.06)	(0.07)	(0.15)	(0.13)
GDP per capita	0.022	0.062	-0.019	0.000
	(0.09)	(0.10)	(0.06)	(0.06)
GDP per capita Growth	10.927	4.036	-5.515	-7.255
	(5.99)	(7.01)	(5.61)	(5.28)
Inflation	-0.000	0.000	0.001	0.002
	(0.01)	(0.00)	(0.00)	(0.01)
Unemployment	-0.102	0.020	0.000	-0.052
	(0.22)	(0.28)	(0.15)	(0.15)
Employment Level	-0.265	-0.013	-0.059	-0.004
	(0.27)	(0.30)	(0.11)	(0.11)
Human Capital	-16.287	-11.041	-2.704	-2.627
	(11.72)	(14.72)	(4.94)	(4.69)
Public Sector	-0.202	-0.136	0.286	0.264
	(0.23)	(0.26)	(0.17)	(0.16)
Remittances	4.272	-7.085	4.650	2.854
	(40.82)	(36.62)	(22.01)	(20.88)
Rural Population	0.141	0.330	-0.135	-0.027
	(0.55)	(0.71)	(0.40)	(0.36)
Left Legislature	0.008	0.010	-2.364*	-1.864
	(0.01)	(0.01)	(1.33)	(1.43)
Democracy	-17.397	-18.868	1.974	1.694
	(25.00)	(26.90)	(3.85)	(3.70)
Natural Resource Rent	-0.057	-0.070	0.023	0.043
	(1.11)	(1.18)	(0.09)	(0.08)
Boom (2003-2013)	0.713	0.918	-0.986	-1.132
	(0.92)	(1.08)	(1.09)	(1.03)
Constant	36.855	24.945	106.698*	107.689*
	(68.03)	(62.11)	(57.84)	(54.73)
R-squared	0.496	0.481	0.383	0.414
N	181	181	398	398

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

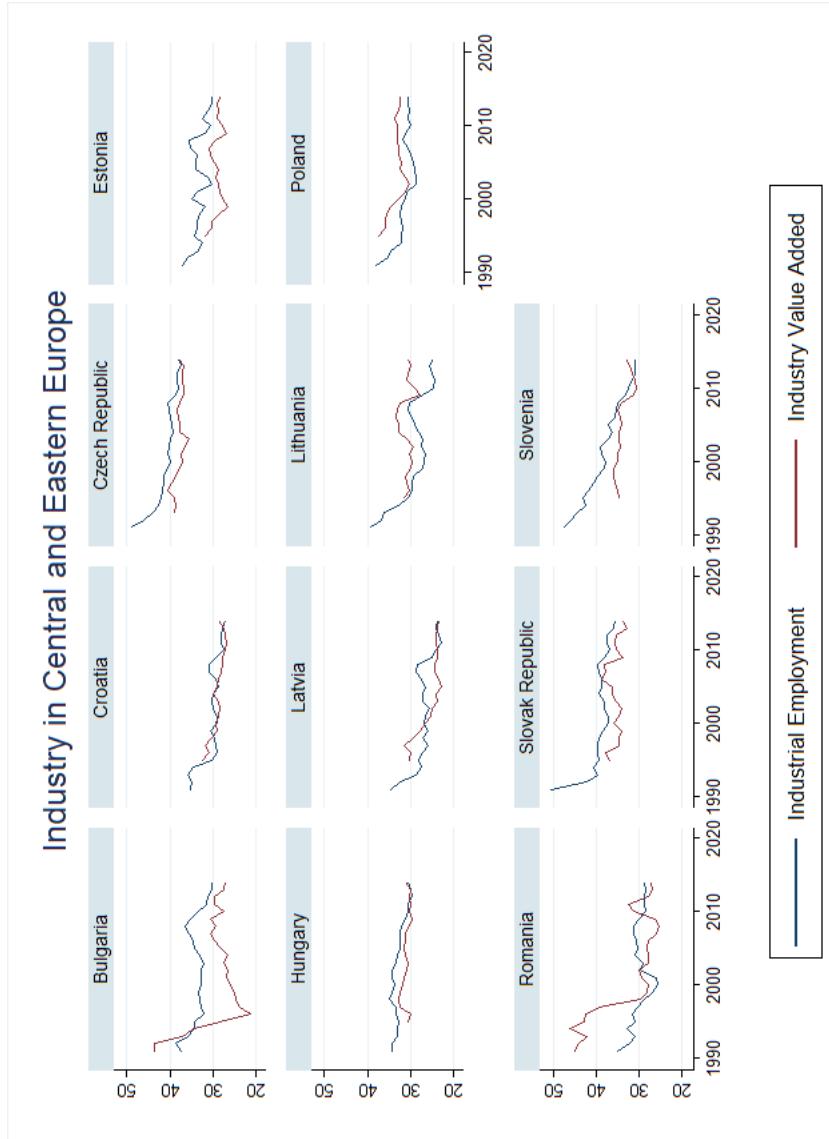
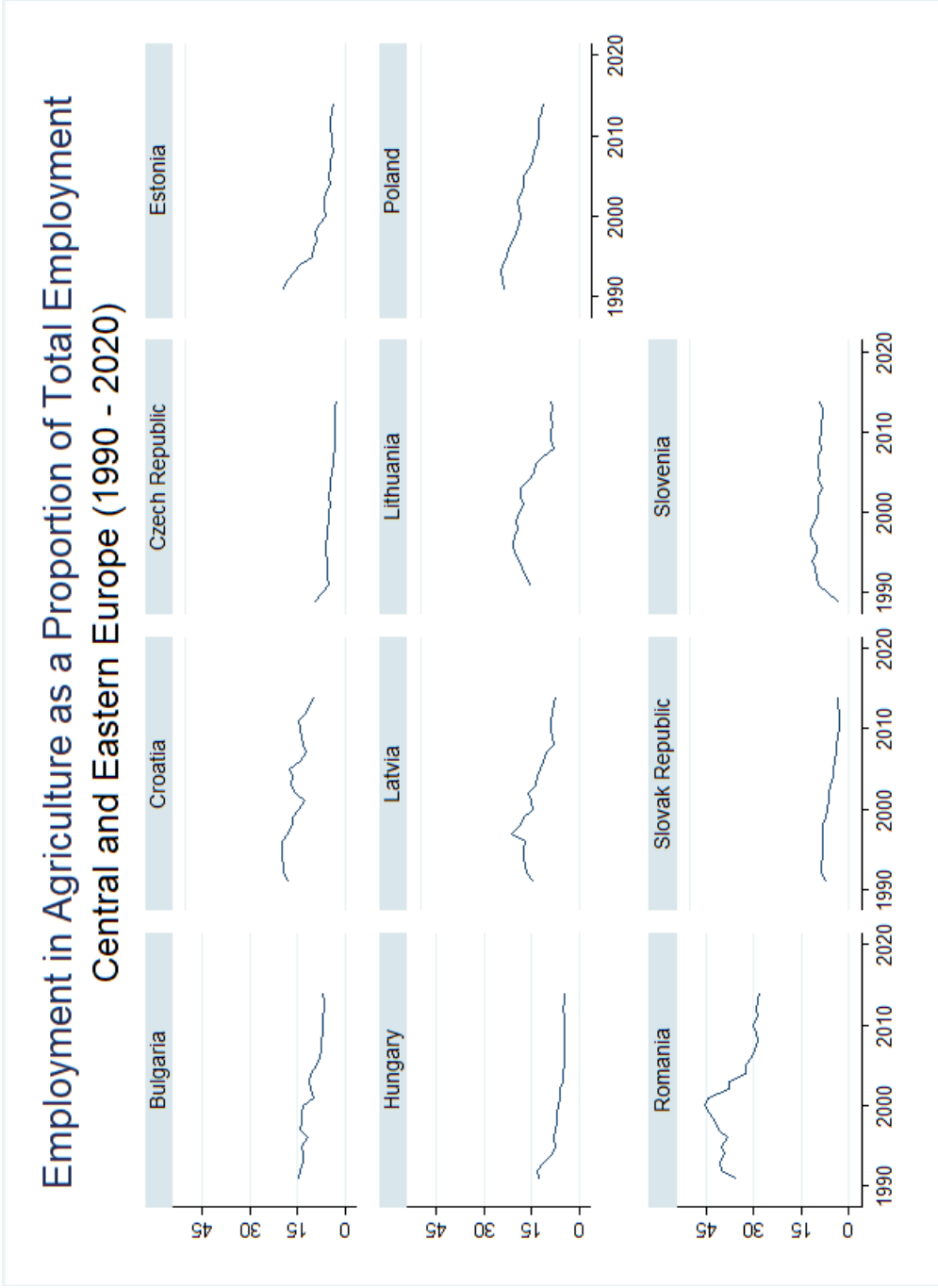


Figure A1.1: Industrial Employment and Industrial Value Added in Eastern Europe

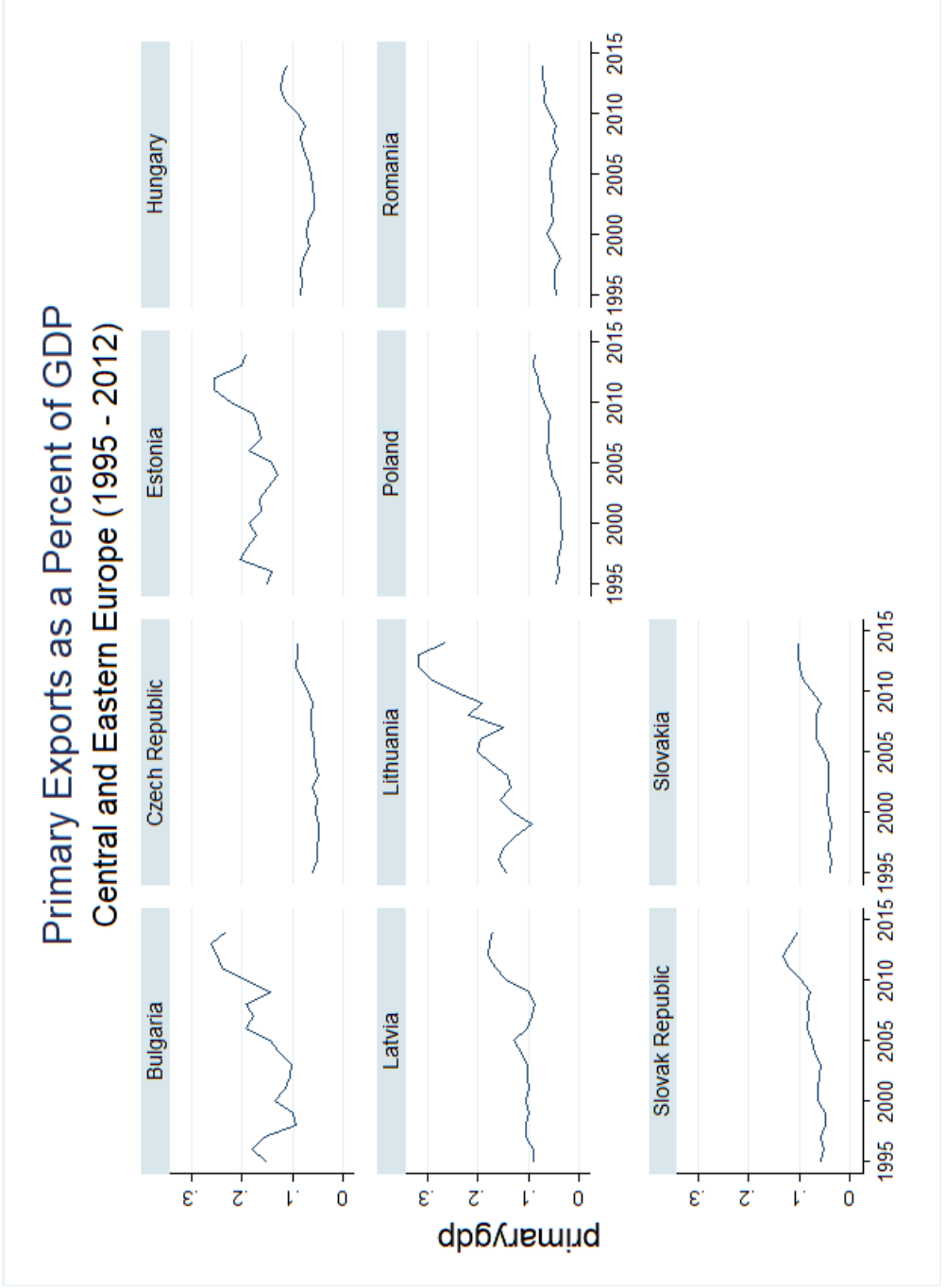
APPENDIX TO CHAPTER 3

Table A2.1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
GINI	45.83614	6.04524	31.30451	56.88947
Labor share	.4245894	.047997	.324	.538
Bottom 20% share	.0769372	.0166246	.0456806	.1092055
Top 20% share	.4015017	.0456565	.3398753	.5364331
Agricultural employment	12.38212	9.790922	3	45.2
Agriculture value added	5.104433	3.433092	1.680692	21.42586
Primary goods exports	.2331633	.1176274	.0950186	.4762346
Agriculture exports	.0450302	.0586485	.0049609	.2751994
Food exports	.082595	.0453711	.0268109	.2080761
Fuels exports	.0674384	.0600106	.0059413	.2721319
Ores exports	.0384492	.0297371	.0102135	.2019781
Industrial employment	33.00199	4.688617	22.9	41.9
Capital openness	1.227647	1.344471	-1.888895	2.389668
Trade	106.4973	29.80862	44.39126	171.4538
FDI inflows	5.086118	4.40272	-.9470897	28.39126
Economic growth	4.243058	4.7436	-14.55986	13.08143
GDP per capita	9.796227	.3003688	9.055157	10.34618
Inflation	8.761442	15.04549	-1.145753	154.7635
Unemployment	10.07417	4.10537	3.9	19.9
Employment level	51.66232	4.10746	43.544	62.381
Human capital	3.176852	.2393517	2.742059	3.640574
Public sector	19.23169	2.203947	11.74772	25.883
Remittances	.0129095	.0129037	.000239	.0605783
Rural population	36.83476	7.547914	25.487	50.052
Left seats	39.64702	35.53554	0	100
Democracy	.8243774	.0912702	.5960517	.9207084



Appendix Figure 1: Agricultural Employment in Central and Eastern Europe (1990-2013)



Appendix Figure 2: Market Income Inequality in Central and Eastern Europe (1990-2013)

Table A2.2: Correlation Matrix (Large Sample)

	GINI	LAB	B20	T20	AgEm	AgVa	PrEx	AgEx	FoEx	FuEx	OrEx	InEm	KAL	TRA	FDI	GRW	GDP	INFL	UNEM	PUBL	REM	RURP	Left	DEM
GINI	1.00																							
LAB	-0.04	1.00																						
B20	-0.39	0.23	1.00																					
T20	0.34	-0.15	-0.91	1.00																				
AgEm	-0.16	-0.29	-0.26	0.18	1.00																			
AgVa	-0.54	-0.32	0.01	0.00	0.67	1.00																		
PrEx	0.19	-0.14	-0.59	0.50	0.06	0.22	1.00																	
AgEx	0.35	0.07	-0.31	0.34	0.10	0.03	0.50	1.00																
FoEx	0.29	0.03	-0.50	0.43	-0.07	0.18	0.81	0.27	1.00															
FuEx	0.17	-0.23	-0.39	0.27	0.05	0.08	0.67	-0.09	0.46	1.00														
OrEx	-0.59	-0.26	-0.20	0.13	0.04	0.31	0.40	-0.10	0.21	0.14	1.00													
InEm	-0.44	0.09	0.65	-0.47	-0.37	-0.13	-0.59	-0.44	-0.53	-0.37	0.00	1.00												
KAL	0.39	0.16	-0.34	0.26	-0.39	-0.54	0.26	0.29	0.15	0.24	-0.15	-0.17	1.00											
TRA	0.20	0.20	0.01	0.00	-0.67	-0.47	-0.01	-0.12	0.03	0.16	-0.14	0.13	0.58	1.00										
FDI	0.03	-0.24	-0.12	0.12	-0.22	-0.07	0.16	-0.01	0.02	0.12	0.33	0.09	0.14	0.14	1.00									
GRW	0.27	-0.22	-0.26	0.26	0.01	-0.13	0.16	0.24	-0.01	0.10	0.02	-0.13	0.13	0.11	0.30	1.00								
GDP	0.35	0.34	0.12	-0.13	-0.57	-0.76	-0.43	-0.36	-0.33	-0.06	-0.35	0.16	0.54	0.60	-0.01	0.00	1.00							
INFL	-0.12	-0.19	0.07	-0.01	0.17	0.53	0.08	-0.01	0.09	0.00	0.16	0.07	-0.29	-0.19	-0.14	-0.17	-0.34	1.00						
UNEM	0.13	-0.19	-0.19	0.14	-0.02	0.09	0.31	0.18	0.28	0.21	0.06	-0.31	-0.24	-0.07	0.01	-0.01	-0.39	0.04	1.00					
PUBL	0.32	0.25	0.27	-0.22	-0.36	-0.40	-0.01	0.20	0.07	-0.07	-0.33	0.13	0.09	0.04	0.02	-0.07	-0.02	-0.23	0.17	1.00				
REM	0.10	0.03	-0.32	0.20	-0.21	-0.13	0.42	0.05	0.36	0.32	0.34	-0.40	0.11	0.11	0.00	0.14	-0.11	0.27	-0.06	1.00				
RURP	-0.18	0.20	0.13	-0.18	0.40	0.14	-0.47	-0.27	-0.50	-0.23	-0.12	0.04	-0.35	-0.18	-0.25	-0.03	0.04	0.11	-0.02	-0.24	-0.14	1.00		
Left	-0.06	0.07	0.01	-0.03	0.22	-0.23	-0.24	-0.12	-0.09	-0.07	-0.01	-0.10	-0.04	-0.11	0.03	-0.03	0.07	-0.10	-0.13	-0.21	0.23	1.00		
DEM	0.49	0.11	-0.20	0.23	-0.43	-0.58	0.10	0.30	0.21	0.03	-0.45	0.04	0.41	0.26	0.06	0.12	0.39	-0.29	-0.01	0.31	-0.02	-0.40	-0.16	1.00

5.2 Top 20% and Bottom 20% Income Shares Models

The models below complement the analysis in the main body of the paper by regressing the top and the bottom quintiles' income share on my variables of interest. The results are consistent with the story revealed by the top 20 / bottom 20% ratio models: higher primary goods exports are associated with a higher income share for the richest quintile and a lower income share for the poorest 20%. They therefore corroborate the hypothesis that trade with commodities has exacerbated income differentials in Central and Eastern Europe.

Table A2.3: Primary exports and the top 20% income share in Eastern Europe

	Model A2.1	Model A2.2	Model A2.3	Model A2.4	Model A2.5
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.002 (0.00)				
Primary goods exports		0.301** (0.09)			
Agricultural exports			1.484* (0.66)		
Foods exports				0.452* (0.21)	
Ores and metals exports					-0.482* (0.23)
Industrial employment	-0.002 (0.00)	0.000 (0.00)	0.001 (0.00)	-0.000 (0.00)	-0.001 (0.00)
Democracy	-0.034 (0.14)	-0.039 (0.14)	-0.093 (0.14)	-0.042 (0.14)	-0.068 (0.14)
Left seats	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Capital account openness	0.012** (0.00)	0.011** (0.00)	0.009** (0.00)	0.013*** (0.00)	0.013** (0.00)
Trade	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
FDI inflows	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
GDP growth	0.000 (0.00)	0.000 (0.00)	-0.001 (0.00)	0.000 (0.00)	-0.000 (0.00)
GDP per capita	-0.060* (0.03)	-0.037 (0.02)	-0.011 (0.02)	-0.045 (0.03)	-0.035 (0.03)
Inflation	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Unemployment	-0.002* (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.002* (0.00)	-0.002* (0.00)
Government consumption	-0.003* (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)
Remittances	0.563* (0.20)	0.607* (0.22)	0.672* (0.25)	0.577* (0.20)	0.562* (0.21)
Commodity boom	-0.008 (0.01)	-0.005 (0.01)	-0.005 (0.01)	-0.005 (0.01)	-0.009 (0.01)
Constant	1.160* (0.43)	0.839* (0.30)	0.595* (0.26)	0.937** (0.32)	0.883* (0.31)
R-squared	0.081	0.091	0.115	0.093	0.084
N	182	180	180	180	180

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A2.4: Primary exports and the bottom 20% income share in Eastern Europe

	Model A2.6	Model A2.7	Model A2.8	Model A2.9	Model A2.10	
	b/se	b/se	b/se	b/se	b/se	
Agricultural employment	0.001 (0.00)					
Primary goods exports		-0.088* (0.04)				
Agricultural exports			-0.373* (0.16)			
Foods exports				-0.129* (0.07)		
Fuels exports					0.099* (0.04)	
Metals exports						0.118* (0.06)
Industrial employment	0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
Redistribution	0.001** (0.00)	0.001* (0.00)	0.001** (0.00)	0.001* (0.00)	0.001** (0.00)	0.001*** (0.00)
Democracy	-0.039 (0.04)	-0.038 (0.04)	-0.024 (0.04)	-0.037 (0.04)	-0.031 (0.04)	-0.031 (0.04)
Left seats	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Capital account openness	-0.006*** (0.00)	-0.006*** (0.00)	-0.005** (0.00)	-0.006*** (0.00)	-0.005** (0.00)	-0.006*** (0.00)
Trade openness	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)
FDI inflows	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Economic growth	-0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.000 (0.00)
GDP per capita	0.020* (0.01)	0.013* (0.01)	0.007 (0.01)	0.016* (0.01)	0.007 (0.01)	0.013* (0.01)
Inflation	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Unemployment	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)
Government consumption	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Personal remittances	-0.325*** (0.06)	-0.329*** (0.07)	-0.367*** (0.08)	-0.320*** (0.06)	-0.327*** (0.06)	-0.347*** (0.06)
Commodity boom	0.003 (0.00)	0.002 (0.00)	0.001 (0.00)	0.002 (0.00)	0.002 (0.00)	0.003 (0.00)
Constant	-0.134 (0.12)	-0.040 (0.08)	0.016 (0.07)	-0.068 (0.08)	0.005 (0.09)	-0.058 (0.08)
R-squared	0.28	.279	.294	.279	.283	.273
N	181	179	179	179	179	179

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

5.3 Prais Winsten Regressions with Country Dummies (Eastern Europe)

These models re-run the Prais Winsten models from the main analysis adding country dummies. The results point to the same conclusions drawn from the fixed effects regressions. Agricultural employment is negatively signed and statistically significant. Primary goods, agricultural goods, foods, and ores exports all come out positively signed and statistically significant. This implies that the results from my fixed effects models with Driscoll-Kraay standard errors are robust to an alternative empirical technique which is similarly very conservative.

Table A2.5: Employment structure and market income inequality (Prais Winsten regressions)

	Model A2.11	Model A2.12	Model A2.13	Model A2.14	Model A2.15
	b/se	b/se	b/se	b/se	b/se
Agricultural employment	-0.215* (0.10)				
Primary goods exports		17.351** (6.20)			
Agricultural exports			103.708*** (31.19)		
Foods exports				23.152 (14.87)	
Ores and metals exports					33.038* (17.31)
Industrial employment	-0.333** (0.12)	-0.134 (0.10)	-0.113 (0.09)	-0.160 (0.10)	-0.147 (0.10)
Democracy	-6.309 (4.62)	-5.458 (4.71)	-6.348 (4.88)	-5.208 (4.78)	-4.924 (4.74)
Left seats	0.004 (0.00)	0.004 (0.00)	0.004 (0.00)	0.004 (0.00)	0.005 (0.00)
Capital account openness	-0.014 (0.17)	0.064 (0.17)	-0.076 (0.17)	0.057 (0.17)	-0.083 (0.17)
Trade	-0.032** (0.01)	-0.045*** (0.01)	-0.030** (0.01)	-0.038** (0.01)	-0.031** (0.01)
FDI inflows	0.010 (0.03)	-0.002 (0.03)	-0.001 (0.02)	0.004 (0.03)	-0.010 (0.03)
GDP growth	0.053* (0.02)	0.030 (0.02)	0.006 (0.02)	0.045* (0.03)	0.024 (0.02)
GDP per capita	3.391* (2.01)	4.834*** (1.40)	6.360*** (1.34)	5.326*** (1.47)	5.401*** (1.39)
Inflation	0.001* (0.00)	0.001 (0.00)	0.001 (0.00)	0.001* (0.00)	0.001 (0.00)
Unemployment	0.001 (0.07)	0.029 (0.06)	0.040 (0.06)	0.055 (0.06)	0.061 (0.06)
Government consumption	-0.017 (0.07)	0.013 (0.07)	0.014 (0.07)	0.024 (0.07)	-0.014 (0.07)
Remittances	-3.075 (11.71)	8.724 (11.20)	14.413 (11.17)	4.641 (11.28)	7.265 (11.58)
Commodity boom	0.605* (0.36)	0.627* (0.35)	0.776* (0.33)	0.698* (0.37)	0.598* (0.35)
Bulgaria	-5.713** (1.80)	-6.125*** (1.67)	-3.186* (1.31)	-4.904** (1.73)	-4.975*** (1.50)
Czech Republic	5.312*** (0.86)	5.566*** (0.87)	5.611*** (0.89)	5.554*** (0.86)	6.180*** (0.90)
Estonia	9.000*** (1.51)	8.812*** (1.49)	7.740*** (1.46)	9.509*** (1.55)	10.806*** (1.41)
Hungary	10.417*** (1.36)	11.956*** (1.04)	12.851*** (1.08)	11.431*** (1.25)	12.681*** (1.12)
Latvia	13.595*** (1.83)	13.880*** (1.76)	11.825*** (1.85)	14.332*** (1.89)	15.774*** (1.71)
Lithuania	13.355*** (1.28)	11.822*** (1.57)	14.277*** (1.21)	12.733*** (1.70)	14.821*** (1.33)
Poland	10.102*** (1.28)	9.764*** (1.34)	11.403*** (1.37)	9.654*** (1.41)	10.443*** (1.32)
Romania	3.268 (2.05)	0.191 (1.76)	1.647 (1.63)	0.586 (1.77)	1.240 (1.69)
Slovakia	5.911*** (1.23)	6.586*** (1.29)	6.543*** (1.29)	6.565*** (1.27)	6.632*** (1.29)
Constant	27.078 (24.80)	2.052 (16.27)	-14.976 (15.24)	-2.832 (16.67)	-4.505 (15.93)
R-squared	0.939	0.947	0.949	0.945	0.946
N	181	179	179	179	179

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5.3.1 Imports Models

I am currently considering ways of re-writing this paper. One way in which I can emphasize the political story better is by focusing on commodity imports. Central and Eastern European countries liberalized their markets relatively early during the transition. Competition with foreign imports hit domestic producers hard. Many proved incapable of withstanding competitive pressures. Simultaneously, post-communist countries were denied access to European markets during the initial years of the transition. This asymmetrical relationship shaped the evolution of the commodity-producing sector in Eastern Europe.

The models below seek to assess the impact of primary goods, agricultural goods, foods, metals, and fuels imports on market income inequality. The imports measures mirror the exports variables included in the main analysis. They were constructed by dividing the amount of a specific type of imports by the amount of total imports flowing into each country in a given year. As a robustness check, I calculate commodity imports as a share of GDP.

To anticipate the findings, rising primary goods imports are associated with higher market income inequality in post-communist countries. These results are robust to different model specifications. When I run two-stage regression models with agricultural imports as an instrument for agricultural employment levels, I find that agricultural employment carries a negative, statistically significant coefficient and that imports are a good instrument. These results suggest that rising foreign agricultural imports are associated with falling agricultural employment, which has a positive impact on market income inequality.

Table A2.6: Commodity imports and market income inequality in Eastern Europe

	Model A2.16	Model A2.17	Model A2.18	Model A2.19	Model A2.20
	b/se	b/se	b/se	b/se	b/se
Primary goods imports	25.700*** (4.05)				
Agricultural imports		33.759 (103.74)			
Foods imports			66.553* (27.77)		
Fuels imports				22.052*** (5.35)	
Ores and metals imports					83.675* (30.79)
Industrial employment	-0.285* (0.15)	-0.341* (0.18)	-0.362* (0.15)	-0.320* (0.15)	-0.286 (0.17)
Electoral democracy	-25.498*** (3.08)	-25.788*** (4.55)	-28.579*** (4.20)	-23.612*** (3.70)	-25.304*** (3.17)
Left seats	0.006* (0.00)	0.009** (0.00)	0.005 (0.00)	0.008* (0.00)	0.009** (0.00)
Capital account openness	0.186 (0.27)	0.009 (0.20)	0.159 (0.19)	0.142 (0.25)	-0.106 (0.22)
Trade openness	-0.087*** (0.02)	-0.049* (0.02)	-0.078*** (0.02)	-0.070** (0.02)	-0.062** (0.02)
FDI inflows	-0.013 (0.02)	-0.004 (0.03)	0.024 (0.03)	-0.009 (0.02)	-0.032 (0.03)
Economic growth	0.099** (0.03)	0.074* (0.03)	0.096*** (0.02)	0.099** (0.03)	0.073** (0.02)
GDP per capita	5.365*** (1.09)	6.684*** (0.94)	6.192*** (1.05)	5.736*** (1.11)	6.704*** (0.81)
Inflation	-0.001 (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.000 (0.00)	0.001 (0.00)
Unemployment	0.056 (0.04)	0.067* (0.04)	0.065 (0.04)	0.045 (0.04)	0.098* (0.04)
Public sector	0.007 (0.06)	-0.095 (0.07)	-0.172** (0.06)	0.006 (0.06)	-0.118* (0.07)
Rural population	0.542** (0.15)	0.375* (0.17)	0.601** (0.20)	0.402* (0.15)	0.488* (0.17)
Remittances	8.681 (15.00)	-7.540 (12.32)	-6.402 (12.20)	3.912 (14.10)	-7.157 (11.92)
Commodity boom (2003-2013)	1.064 (0.65)	0.865 (0.57)	1.132* (0.63)	0.905 (0.65)	0.970* (0.51)
Constant	6.579 (11.05)	3.310 (8.94)	4.582 (9.53)	8.108 (11.06)	-2.608 (10.99)
R-squared	0.471	0.411	0.455	0.442	0.435
N	179	179	179	179	179

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table A2.7: Agricultural imports and market income inequality in Eastern Europe (Detrended models)

	Model A2.21	Model A2.22	Model A2.23	Model A2.24	Model A2.25
	b/se	b/se	b/se	b/se	b/se
Primary goods imports	24.525*** (4.12)				
Agricultural imports		37.384 (96.83)			
Food imports			63.621* (28.29)		
Fuels imports				21.393*** (4.50)	
Ores and metals imports					79.707* (31.96)
Industrial employment	-0.383* (0.16)	-0.425* (0.19)	-0.444* (0.16)	-0.418* (0.16)	-0.368* (0.18)
Electoral democracy	-26.248*** (3.16)	-26.496*** (4.33)	-29.069*** (4.22)	-24.422*** (3.59)	-25.887*** (3.20)
Left seats	0.004 (0.00)	0.007* (0.00)	0.004 (0.00)	0.006* (0.00)	0.007* (0.00)
Capital account openness	0.294 (0.28)	0.104 (0.21)	0.250 (0.20)	0.254 (0.27)	-0.010 (0.24)
Trade openness	-0.075*** (0.02)	-0.042* (0.02)	-0.068*** (0.02)	-0.059** (0.02)	-0.054** (0.02)
FDI inflows	-0.014 (0.02)	-0.004 (0.03)	0.022 (0.03)	-0.010 (0.02)	-0.031 (0.03)
Economic growth	0.080** (0.02)	0.060* (0.03)	0.081*** (0.02)	0.081** (0.02)	0.060** (0.02)
GDP per capita	8.534*** (1.22)	9.045*** (1.22)	8.782*** (1.22)	8.798*** (1.25)	9.017*** (1.00)
Inflation	-0.001 (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.000 (0.00)	0.000 (0.00)
Unemployment	0.073* (0.04)	0.076* (0.04)	0.078* (0.04)	0.061 (0.04)	0.106** (0.04)
Public sector	0.060 (0.06)	-0.051 (0.06)	-0.121* (0.05)	0.059 (0.06)	-0.075 (0.06)
Rural population	0.559** (0.15)	0.394* (0.16)	0.611** (0.19)	0.425** (0.14)	0.501** (0.17)
Remittances	8.858 (15.16)	-6.282 (12.64)	-5.602 (12.64)	4.633 (14.40)	-6.290 (12.26)
Commodity boom (2003-2013)	1.015 (0.68)	0.838 (0.59)	1.087 (0.66)	0.865 (0.67)	0.935 (0.54)
Constant	-74.856*** (8.82)	-74.147*** (7.44)	-72.889*** (7.73)	-74.942*** (8.89)	-77.482*** (6.41)
R-squared	0.562	0.516	0.549	0.540	0.534
N	179	179	179	179	179

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table A2.8: Commodities imports and top 20% income share in Eastern Europe (Prais Winsten regressions)

	Model A2.26	Model A2.27	Model A2.28	Model A2.29	Model A2.30
	b/se	b/se	b/se	b/se	b/se
Non-fuel imports	48.356** (15.47)				
Agricultural imports		165.457* (92.74)			
Foods imports			108.153*** (24.66)		
Fuels imports				-26.117 (19.45)	
Ores and metals imports					-102.676* (42.48)
Redistribution	-0.049 (0.10)	-0.132 (0.10)	0.005 (0.10)	-0.185 (0.12)	-0.184* (0.10)
Industrial employment	0.018 (0.16)	0.016 (0.16)	-0.034 (0.15)	-0.108 (0.16)	-0.151 (0.17)
Electoral democracy	0.149 (19.27)	-1.017 (19.88)	-0.819 (18.85)	0.334 (20.13)	2.357 (19.74)
Left seats	0.004 (0.01)	0.007 (0.01)	0.001 (0.01)	0.008 (0.01)	0.007 (0.01)
Capital account openness	0.994* (0.41)	0.881* (0.40)	1.245** (0.39)	0.677 (0.43)	0.976** (0.33)
Trade openness	-0.042 (0.03)	-0.014 (0.02)	-0.060* (0.03)	0.004 (0.04)	-0.004 (0.02)
FDI inflows	-0.054 (0.07)	-0.076 (0.08)	-0.001 (0.07)	-0.061 (0.07)	-0.033 (0.07)
Economic growth	0.010 (0.05)	-0.009 (0.05)	0.032 (0.06)	0.012 (0.05)	0.043 (0.05)
GDP per capita	-2.547 (2.42)	-2.397 (2.47)	-2.931 (2.51)	-1.164 (2.15)	-2.310 (2.60)
Inflation	0.002 (0.00)	0.002 (0.00)	0.001 (0.00)	0.003*** (0.00)	0.002* (0.00)
Unemployment	-0.095 (0.10)	-0.095 (0.09)	-0.124 (0.09)	-0.084 (0.10)	-0.147 (0.09)
Rural population	-0.144 (0.44)	-0.289 (0.44)	-0.072 (0.42)	-0.306 (0.46)	-0.413 (0.44)
Public sector	-0.308* (0.15)	-0.201 (0.16)	-0.389* (0.16)	-0.383* (0.20)	-0.236 (0.15)
Remittances	64.069* (23.62)	76.130** (25.60)	56.675* (24.26)	60.342* (25.83)	73.322** (25.44)
Commodity boom (2003-2013)	-0.754 (1.05)	-0.875 (1.01)	-0.636 (1.07)	-0.957 (1.04)	-1.039 (0.99)
Constant	77.510* (29.30)	81.879** (27.65)	81.598* (29.65)	80.332** (26.08)	93.284** (30.90)
R-squared	0.116	0.107	0.147	0.120	0.117
N	179	179	179	179	179

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

5.3.2 Additional Notes

The results reported in the main analysis are robust to the addition of industrial employment as a control. The income shares models are mostly robust to the addition of a control for redistribution.

APPENDIX TO CHAPTER 4

5.4 Summary Statistics

Table A3.1: Summary Statistics (Large Sample)

Variable	Mean	Std. Dev.	Min	Max
Market income inequality	49.975	4.809	36.293	64.160
Bottom 20% income share	3.566	1.014	0.797	5.910
Top 20% income share	56.098	5.234	39.589	69.691
Agricultural employment	18.565	12.014	0.3	52.3
Food production index	86.635	26.243	36.98	178.52
Crop production index	91.185	28.958	30.49	242.11
Primary goods exports	0.147	0.112	0.007	0.628
Agricultural exports	0.006	0.008	0.000	0.073
Food exports	0.071	0.067	.001	0.340
Fuel expots	0.043	0.078	0	0.543
Left-wing seats in legislature	0.049	0.124	0	0.888
Democracy	0.611	0.218	0.076	0.933
Capital openness	0.112	1.559	-1.889	2.389
Trade	71.766	39.796	11.546	280.361
FDI inflows	2.707	3.853	-39.695	24.59
GDP per capita growth rate	1.323	4.173	-15.716	16.233
GDP per capita (logged)	23.352	4.301	9.381	28.767
Inflation rate	58.226	512.622	-11.449	11749.64
Unemployment rate	8.668	4.170	1.3	25.6
Human capital	2.251	0.427	1.207	3.411
Government final consumption	13.443	5.331	2.976	43.479
Remittances	0.036	0.052	0	0.274
Rural population	40.737	20.137	4.848	91.466

Table A3.2: Summary Statistics (Reduced Sample)

Variable	Mean	Std. Dev.	Min	Max
Market income inequality	50.333	4.804	38.793	59.786
Bottom 20% income share	3.803	0.975	1.143	5.910
Top 20% income share	55.530	4.876	45.706	67.485
Agricultural employment	16.095	10.218	0.3	38.1
Food production index	81.372	27.1	37.06	178.52
Crop production index	81.959	27.699	30.49	183.45
Primary goods exports	0.155	0.092	0.025	0.379
Agricultural exports	0.008	.009	0	.073
Food exports	0.058	0.048	0.001	0.236
Fuel expots	0.059	0.072	0	0.314
Left-wing seats in legislature	0.085	0.161	0	0.888
Democracy	0.657	0.224	0.076	0.933
Capital openness	0.100	1.427	-1.889	2.389
Trade	45.406	21.024	11.546	123.079
FDI inflows	2.239	2.219	-2.499	12.197
GDP per capita growth rate	1.462	4.343	-14.195	16.233
GDP per capita (logged)	23.217	6.327	9.381	28.767
Inflation rate	119.486	774.106	-1.167	11749.64
Unemployment rate	7.603	3.383	2.5	18.8
Human capital	2.333	0.331	1.482	3.052
Government final consumption	12.433	3.159	2.976	22.734
Remittances	0.011	0.014	2.89e-07	0.080
Rural population	26.162	13.386	4.848	58.312

Table A3.3: Correlation Matrix (Large Sample)

	GINI	B20	T20	AgEm	Food	Crop	PrG	AEx	FoEx	FuEx	Left	Dem	KAL	Trade	FDI	Growth	GDP	Inf	Unem	HC	Gov	Rem	Rural	
GINI	1.00																							
B20	-0.64	1.00																						
T20	0.78	-0.83	1.00																					
AgEm	0.35	-0.35	0.40	1.00																				
Food	-0.18	-0.08	-0.02	-0.02	1.00																			
Crop	-0.19	-0.06	-0.08	0.01	0.89	1.00																		
PrG	-0.26	0.11	-0.09	-0.02	0.11	0.04	1.00																	
AgEx	0.09	-0.05	0.13	0.15	-0.12	-0.11	0.39	1.00																
FoEx	-0.08	-0.08	0.07	0.28	0.02	0.04	0.56	0.51	1.00															
FuEx	-0.36	0.37	-0.42	-0.18	0.07	-0.03	0.53	-0.15	-0.19	1.00														
Left	-0.15	0.15	-0.18	0.09	0.13	0.03	0.11	-0.09	-0.17	0.34	1.00													
Dem	-0.06	0.14	-0.17	-0.41	0.25	0.14	0.03	0.14	-0.05	-0.12	0.11	1.00												
KAL	-0.05	-0.02	-0.06	0.19	0.38	0.27	0.03	0.13	0.05	0.03	0.09	0.21	1.00											
Trade	-0.15	-0.14	0.02	0.15	0.24	0.27	0.39	0.23	0.57	0.00	-0.17	-0.10	0.20	1.00										
FDI	-0.05	0.05	-0.15	-0.12	0.20	0.14	-0.04	-0.02	0.02	0.02	-0.09	0.19	0.25	0.33	1.00									
Growth	-0.08	0.07	-0.04	-0.06	0.18	0.15	0.15	0.04	0.06	0.12	0.04	0.22	0.19	0.13	0.20	1.00								
GDP	0.42	-0.17	0.25	0.25	0.15	0.14	-0.07	0.11	-0.12	-0.04	0.07	-0.15	0.13	0.01	0.07	0.12	1.00							
Infl	0.14	-0.01	0.05	0.03	-0.13	-0.13	0.21	-0.01	-0.01	0.11	0.04	0.03	-0.12	-0.11	-0.07	-0.12	0.05	1.00						
Unem	-0.19	-0.02	-0.01	-0.29	-0.05	0.09	-0.09	-0.15	-0.11	-0.04	-0.16	-0.03	-0.16	0.17	0.06	-0.09	-0.29	-0.04	1.00					
HC	-0.25	0.25	-0.29	-0.64	0.37	0.23	0.39	0.02	0.03	0.28	0.03	0.52	0.22	0.30	0.50	0.24	-0.01	-0.07	0.20	1.00				
Gov	0.01	-0.22	0.22	-0.23	0.09	0.09	0.29	0.07	0.15	-0.02	-0.06	0.00	-0.18	0.22	-0.15	-0.19	-0.00	-0.03	0.19	0.18	1.00			
Rem	0.01	-0.31	0.24	0.50	0.30	0.25	-0.18	-0.06	0.10	-0.27	0.13	-0.12	0.35	0.24	0.13	0.02	0.10	-0.06	-0.03	-0.24	-0.15	1.00		
Rural	-0.07	-0.11	0.02	0.33	-0.06	0.09	0.29	-0.02	0.29	0.24	-0.23	-0.37	-0.01	0.44	0.04	-0.07	0.12	-0.02	0.08	-0.21	0.10	0.21	1.00	

Table A3.4: Correlation Matrix (Reduced Sample)

	Gini	B20	T20	AgE	Food	Crop	PrG	AEEx	FoEx	FuEx	Left	Dem	KAL	Trde	FDI	Grow	GDP	Infl	Unem	HC	Gov	Rem	Rural	
Gini	1.00																							
B20	-0.71	1.00																						
T20	0.81	-0.83	1.00																					
AgEm	0.30	-0.32	0.28	1.00																				
Food	-0.18	-0.02	-0.19	0.05	1.00																			
Crop	-0.10	-0.05	-0.14	0.02	0.96	1.00																		
PrG	-0.19	0.18	-0.14	0.31	0.38	0.26	1.00																	
AgEx	0.34	0.07	0.20	0.22	-0.21	-0.16	0.30	1.00																
FoEx	0.16	0.10	-0.06	0.22	0.29	0.28	0.47	0.46	1.00															
FuEx	-0.44	0.12	-0.22	0.23	0.23	0.11	0.64	-0.22	-0.07	1.00														
Left	-0.23	0.13	-0.24	0.13	0.28	0.21	0.39	-0.20	-0.23	0.66	1.00													
Dem	0.03	-0.02	-0.05	-0.16	0.38	0.38	-0.18	0.13	0.07	-0.47	0.10	1.00												
KAL	-0.07	0.05	-0.20	-0.04	0.46	0.41	0.12	0.15	0.19	-0.16	-0.01	0.30	1.00											
Trade	-0.06	0.04	-0.07	0.45	0.44	0.39	0.77	0.53	0.64	0.32	0.11	-0.01	0.33	1.00										
FDI	0.21	-0.21	0.18	0.02	0.38	0.40	-0.05	0.17	-0.13	-0.35	-0.12	0.27	0.37	0.21	1.00									
Growth	0.02	0.02	-0.01	-0.09	0.26	0.29	0.16	0.04	0.11	0.02	0.05	0.12	0.14	0.16	0.20	1.00								
GDP	0.57	-0.34	0.46	0.38	0.18	0.17	-0.03	0.17	-0.11	-0.10	0.07	-0.22	0.07	0.15	0.17	0.15	1.00							
Infl	0.18	-0.05	0.09	0.08	-0.16	-0.16	0.08	-0.10	-0.10	0.33	0.01	0.02	-0.19	-0.11	-0.13	-0.18	0.05	1.00						
Unem	-0.10	0.05	0.03	-0.37	-0.17	-0.18	-0.17	-0.10	-0.18	0.05	-0.04	0.05	-0.20	-0.36	-0.08	-0.17	-0.44	-0.05	1.00					
HC	-0.14	0.11	-0.19	-0.33	0.66	0.58	0.22	-0.00	0.07	-0.15	0.15	0.36	0.46	0.30	0.47	0.26	0.12	-0.14	-0.17	1.00				
Gov	0.30	-0.24	0.17	0.17	0.22	0.21	-0.44	-0.32	-0.32	-0.17	0.15	0.18	0.00	-0.26	0.11	-0.03	0.18	-0.05	0.23	0.03	1.00			
Rem	0.13	-0.30	0.15	0.32	0.37	0.32	0.35	0.08	0.22	0.33	0.20	-0.03	0.28	0.43	-0.00	0.08	0.30	-0.09	-0.32	0.23	-0.03	1.00		
Rural	0.32	-0.28	0.29	0.59	-0.28	-0.26	0.30	0.18	0.38	0.22	-0.11	-0.42	-0.17	0.25	-0.23	-0.11	0.32	0.09	-0.41	-0.44	-0.08	0.38	1.00	



Figure A3.1: Agricultural employment in Latin America

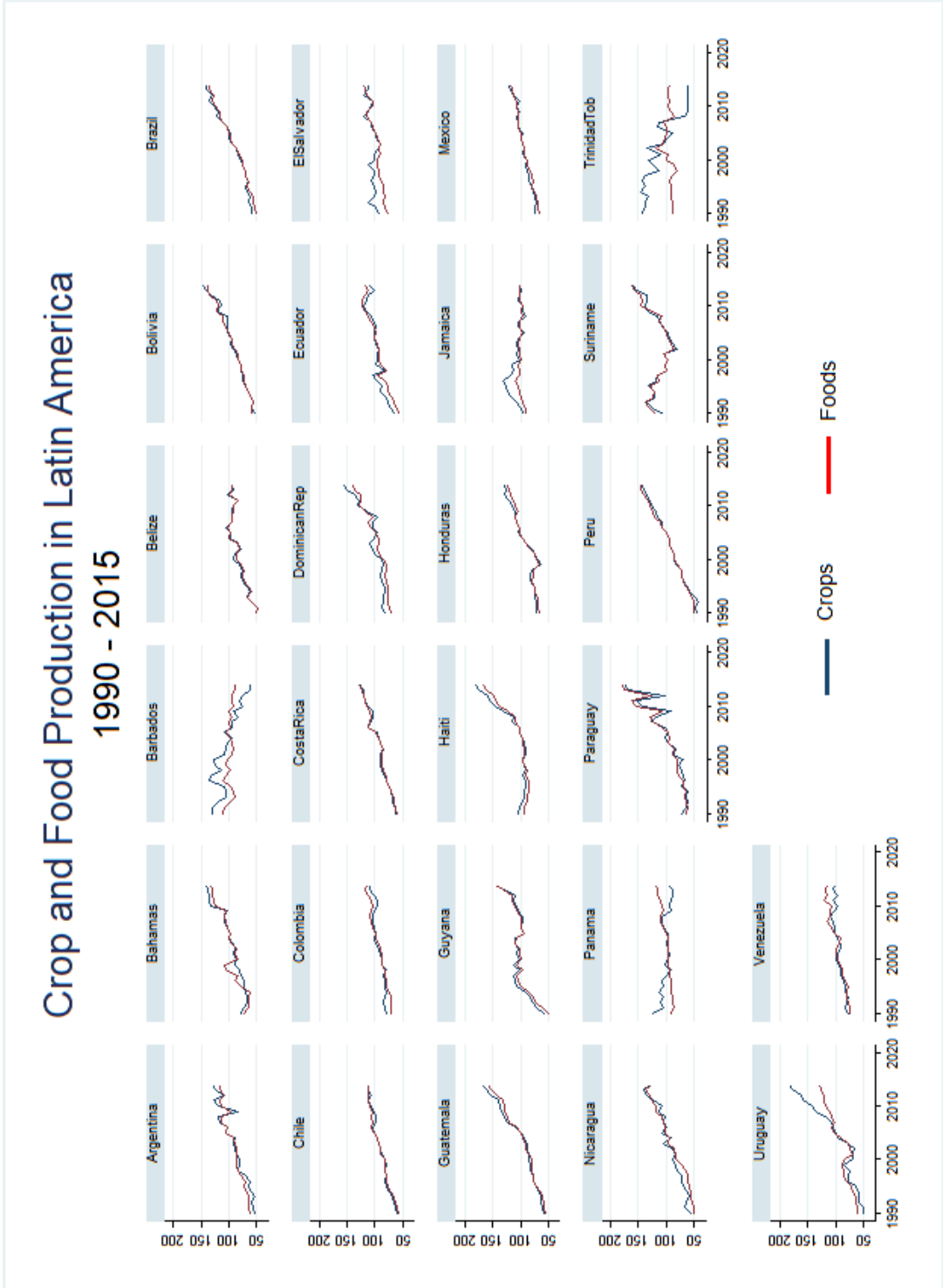


Figure A3.2: Crop and food production in Latin America

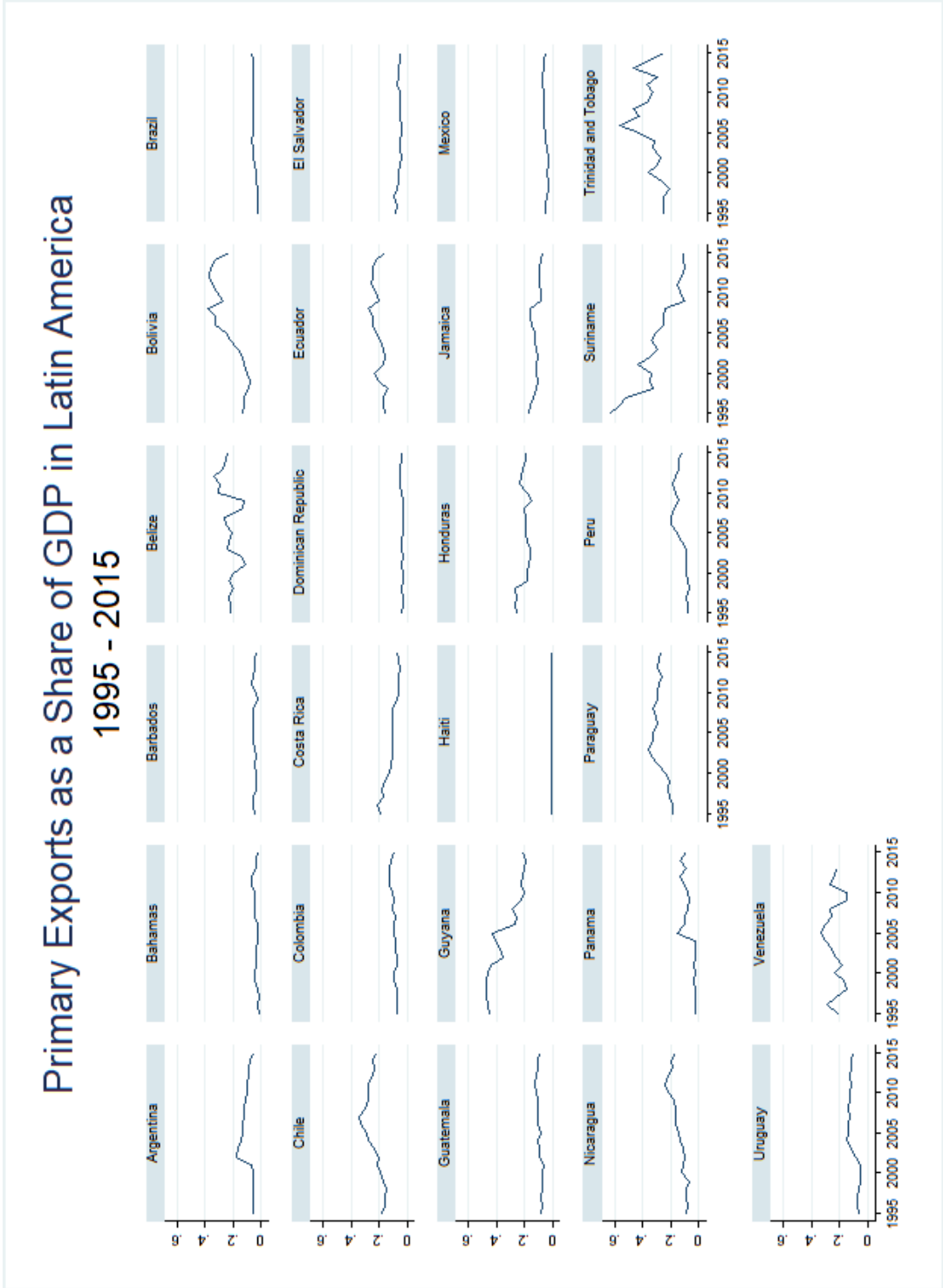


Figure A3.3: Primary exports in Latin America

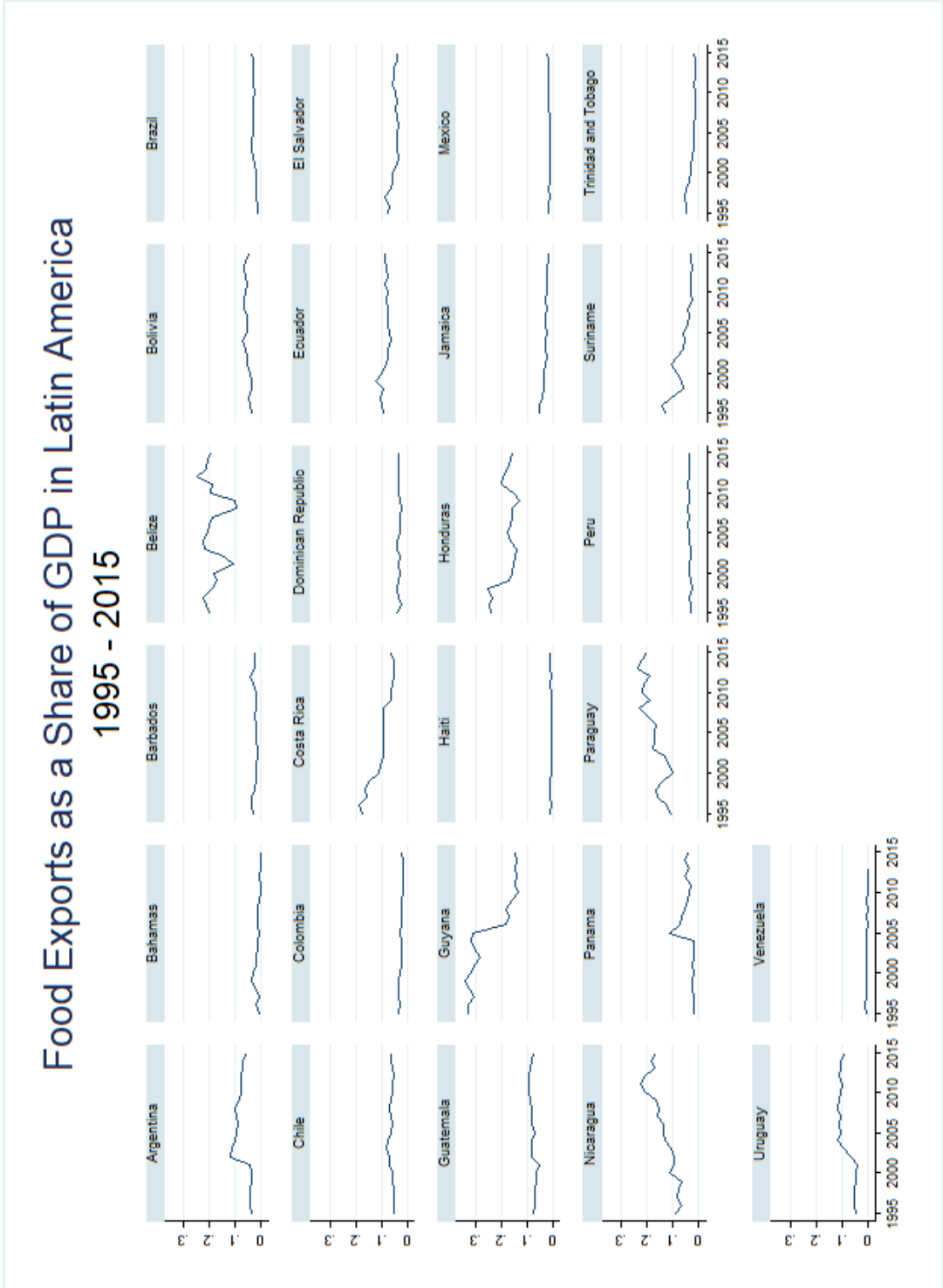


Figure A3.4: Food exports in Latin America

Fuels Exports as a Share of GDP in Latin America 1995 - 2015



Figure A3.5: Fuel exports in Latin America

Ores and Metals Exports as a Share of GDP in Latin America 1995 - 2015



Figure A3.6: Ores exports in Latin America

5.5 Primary Exports as a Share of Total Exports (Latin America)

Table A3.5: Main analysis: large sample

	Model A3.1	Model A3.2	Model A3.3	Model A3.4	Model A3.5
	b/se	b/se	b/se	b/se	b/se
Primary exports	-7.638*** (1.12)				
Agriculture exports		0.343 (3.75)			
Food exports			-5.905*** (1.25)		
Fuels exports				2.511* (1.22)	
Ores and metals exports					-13.348*** (2.61)
Left legislative seats	-6.997** (2.23)	-6.643** (2.15)	-6.916** (2.15)	-7.276** (2.06)	-6.326** (2.10)
Electoral democracy	-2.196 (2.71)	-2.812 (2.83)	-2.993 (2.78)	-2.858 (2.86)	-1.186 (2.56)
Capital account openness	0.289 (0.17)	0.311 (0.20)	0.299 (0.19)	0.276 (0.21)	0.293 (0.18)
Trade openness	-0.033* (0.01)	-0.008 (0.01)	-0.025* (0.01)	-0.009 (0.01)	-0.010 (0.01)
FDI inflows	0.161*** (0.04)	0.120* (0.04)	0.130** (0.04)	0.136** (0.04)	0.164*** (0.03)
Economic growth	0.032 (0.05)	0.024 (0.05)	0.033 (0.05)	0.024 (0.05)	0.020 (0.04)
GDP per capita	0.201** (0.06)	0.198** (0.06)	0.200** (0.06)	0.209** (0.06)	0.177** (0.06)
Inflation	0.032* (0.01)	0.021 (0.01)	0.030* (0.01)	0.020 (0.01)	0.021 (0.02)
Unemployment	0.126 (0.10)	0.134 (0.11)	0.138 (0.10)	0.130 (0.11)	0.120 (0.11)
Human capital index	-6.235** (1.67)	-6.739** (1.93)	-6.345** (1.74)	-7.248** (2.09)	-6.388** (1.87)
Public sector	0.326*** (0.07)	0.340*** (0.06)	0.346*** (0.06)	0.359*** (0.07)	0.307*** (0.07)
Remittances	-5.866 (6.04)	-3.188 (5.50)	-6.117 (6.32)	-3.720 (5.70)	-3.291 (4.97)
Rural population	0.111 (0.09)	0.049 (0.11)	0.093 (0.10)	0.048 (0.12)	0.047 (0.10)
Commodity boom (2003-2013)	-0.569 (0.55)	-0.706 (0.71)	-0.681 (0.64)	-0.739 (0.68)	-0.445 (0.61)
Constant	57.838*** (5.05)	56.954*** (6.29)	57.226*** (5.57)	57.391*** (6.65)	57.195*** (6.01)
R-squared	0.540	0.500	0.518	0.506	0.529
N	331	331	331	331	331

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A3.6: Main analysis: small sample

	Model A3.6	Model A3.7	Model A3.8	Model A3.9	Model A3.10
	b/se	b/se	b/se	b/se	b/se
Primary goods exports	-32.960*** (6.12)				
Agriculture exports		-11.673* (5.42)			
Food exports			7.068*** (1.53)		
Fuels exports				0.887 (1.56)	
Ores and metals exports					-12.167*** (1.59)
Left legislative seats	-2.937* (1.68)	-6.376** (1.95)	-5.672** (1.77)	-6.414** (1.83)	-5.646** (1.85)
Electoral democracy	-0.816 (2.17)	-2.287 (1.97)	-1.653 (2.22)	-2.364 (2.07)	-1.037 (1.88)
Capital account openness	0.419* (0.15)	0.107 (0.14)	0.191 (0.14)	0.102 (0.15)	0.080 (0.14)
Trade openness	0.011 (0.02)	-0.011 (0.02)	0.007 (0.02)	-0.012 (0.02)	-0.005 (0.02)
FDI inflows	0.017 (0.07)	-0.042 (0.06)	-0.060 (0.07)	-0.033 (0.07)	0.031 (0.05)
Economic growth	0.018 (0.03)	0.019 (0.03)	0.005 (0.03)	0.020 (0.04)	-0.001 (0.03)
GDP per capita	0.156* (0.06)	0.069* (0.04)	0.057 (0.04)	0.066 (0.04)	0.049 (0.05)
Inflation	0.006 (0.01)	-0.006 (0.01)	-0.011 (0.01)	-0.002 (0.01)	0.001 (0.02)
Unemployment	0.221* (0.08)	0.242* (0.09)	0.225* (0.09)	0.235* (0.10)	0.227* (0.10)
Human capital index, see note hc	-2.378 (2.02)	-0.987 (1.43)	-1.117 (1.27)	-1.471 (1.67)	-1.802 (1.50)
Public sector	-0.092 (0.09)	-0.035 (0.06)	-0.070 (0.07)	-0.007 (0.08)	-0.100 (0.06)
Remittances	19.036* (10.79)	29.362* (15.32)	39.222** (12.97)	27.510 (16.31)	16.881 (16.02)
Rural population	0.512* (0.21)	0.809** (0.23)	0.769** (0.23)	0.720* (0.27)	0.672** (0.22)
Commodity boom (2003-2013)	-0.096 (0.29)	-0.416 (0.54)	-0.285 (0.51)	-0.342 (0.54)	0.091 (0.40)
Constant	41.625** (10.72)	33.862** (8.86)	32.106** (8.88)	36.292** (10.93)	40.285*** (8.49)
R-squared	0.830	0.765	0.776	0.761	0.789
N	166	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A3.7: Detrended models: large sample

	Model A3.11	Model A3.12	Model A3.13	Model A3.14	Model A3.15
	b/se	b/se	b/se	b/se	b/se
Primary exports	-7.707*** (1.16)				
Agriculture exports		-0.865 (4.22)			
Foods exports			-6.080*** (1.27)		
Fuels exports				3.022* (1.26)	
Ores and metals exports					-13.100*** (2.52)
Left legislative seats	-6.914** (2.20)	-6.606** (2.13)	-6.843** (2.12)	-7.324** (2.04)	-6.288** (2.08)
Electoral democracy	-1.999 (2.61)	-2.677 (2.76)	-2.821 (2.69)	-2.692 (2.79)	-1.118 (2.52)
Capital account openness	0.240 (0.17)	0.274 (0.19)	0.254 (0.18)	0.225 (0.20)	0.269 (0.18)
Trade openness	-0.031** (0.01)	-0.007 (0.01)	-0.024* (0.01)	-0.007 (0.01)	-0.009 (0.01)
FDI inflows	0.172*** (0.04)	0.129** (0.04)	0.140** (0.04)	0.149*** (0.04)	0.168*** (0.03)
Economic growth	0.027 (0.05)	0.020 (0.05)	0.029 (0.05)	0.019 (0.05)	0.018 (0.04)
GDP per capita	0.181** (0.06)	0.184** (0.06)	0.181** (0.05)	0.193** (0.06)	0.167** (0.05)
Inflation	0.031* (0.01)	0.020 (0.01)	0.029* (0.01)	0.019 (0.01)	0.021 (0.02)
Unemployment	0.098 (0.10)	0.111 (0.11)	0.112 (0.10)	0.103 (0.11)	0.106 (0.11)
Human capital index	-3.927* (1.72)	-4.987* (2.01)	-4.197* (1.81)	-5.240* (2.14)	-5.214* (1.98)
Public sector	0.349*** (0.07)	0.358*** (0.07)	0.368*** (0.06)	0.384*** (0.07)	0.320*** (0.07)
Remittances	-5.364 (5.75)	-2.587 (5.53)	-5.718 (5.98)	-3.358 (5.45)	-3.018 (4.85)
Rural population	0.055 (0.08)	0.006 (0.11)	0.041 (0.10)	-0.004 (0.12)	0.018 (0.10)
Commodity boom (2003-2013)	-0.295 (0.58)	-0.502 (0.71)	-0.427 (0.65)	-0.495 (0.68)	-0.310 (0.61)
Constant	6.288 (5.08)	9.071 (6.23)	7.605 (5.57)	9.579 (6.86)	8.463 (6.07)
R-squared	0.453	0.405	0.427	0.413	0.437
N	331	331	331	331	331

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A3.8: Detrended models: small sample

	Model A3.16	Model A3.17	Model A3.18	Model A3.19	Model A3.20
	b/se	b/se	b/se	b/se	b/se
Primary goods exports	-1.534 (1.90)				
Agriculture exports		-9.641* (4.63)			
Food exports			6.938*** (1.59)		
Fuels exports				0.791 (1.48)	
Ores and metals exports					-12.219*** (1.63)
Left legislative seats	-6.447** (1.87)	-6.501** (1.96)	-5.767** (1.78)	-6.517** (1.83)	-5.723** (1.86)
Electoral democracy	-2.734 (1.98)	-2.698 (1.96)	-1.890 (2.23)	-2.689 (2.06)	-1.241 (1.88)
Capital account openness	0.045 (0.15)	0.048 (0.15)	0.154 (0.14)	0.053 (0.16)	0.046 (0.14)
Trade openness	-0.016 (0.02)	-0.011 (0.02)	0.007 (0.02)	-0.012 (0.02)	-0.004 (0.02)
FDI inflows	-0.025 (0.07)	-0.031 (0.06)	-0.052 (0.07)	-0.025 (0.07)	0.038 (0.05)
Economic growth	0.018 (0.04)	0.016 (0.04)	0.003 (0.03)	0.018 (0.04)	-0.002 (0.03)
GDP per capita	0.074* (0.04)	0.074* (0.04)	0.060 (0.04)	0.070 (0.04)	0.052 (0.05)
Inflation	-0.000 (0.01)	-0.006 (0.01)	-0.011 (0.01)	-0.003 (0.01)	0.000 (0.02)
Unemployment	0.217* (0.10)	0.214* (0.10)	0.210* (0.09)	0.213* (0.10)	0.212* (0.10)
Human capital index	-1.137 (1.56)	-0.347 (1.50)	-0.683 (1.27)	-0.865 (1.73)	-1.383 (1.49)
Public sector	-0.004 (0.07)	-0.014 (0.07)	-0.059 (0.07)	0.007 (0.08)	-0.091 (0.06)
Remittances	22.515 (19.06)	27.057* (15.32)	37.830** (12.85)	25.865 (16.22)	15.719 (15.83)
Rural population	0.484* (0.27)	0.562* (0.23)	0.638* (0.23)	0.531* (0.26)	0.550* (0.22)
Commodity boom (2003-2013)	-0.178 (0.52)	-0.238 (0.53)	-0.190 (0.51)	-0.206 (0.52)	0.184 (0.40)
Constant	-3.286 (10.21)	-7.335 (8.99)	-9.527 (8.87)	-5.564 (10.85)	-4.553 (8.43)
R-squared	0.679	0.682	0.696	0.678	0.715
N	184	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A3.9: Prais Winsten regressions: large sample

	Model A3.21	Model A3.22	Model A3.23	Model A3.24	Model A3.25
	b/se	b/se	b/se	b/se	b/se
Primary exports	3.165** (1.17)				
Agriculture exports		16.188** (6.06)			
Food exports			0.806 (1.02)		
Fuels exports				-2.389** (0.89)	
Ores and metals exports					5.299* (2.67)
Left legislative seats	-2.842** (0.98)	-2.928** (0.98)	-3.014** (0.99)	-2.177* (0.95)	-2.774** (1.01)
Electoral democracy	2.862* (1.58)	2.551 (1.59)	2.927* (1.61)	2.703* (1.60)	3.364* (1.55)
Capital account openness	0.187 (0.13)	0.207 (0.14)	0.205 (0.14)	0.214 (0.13)	0.188 (0.13)
Trade openness	0.019* (0.01)	0.013* (0.01)	0.013* (0.01)	0.010 (0.01)	0.014* (0.01)
FDI inflows	0.040 (0.03)	0.044 (0.03)	0.046* (0.03)	0.040 (0.03)	0.034 (0.03)
Economic growth	-0.019 (0.02)	-0.017 (0.02)	-0.020 (0.02)	-0.014 (0.02)	-0.018 (0.02)
GDP per capita	0.202*** (0.05)	0.185*** (0.05)	0.204*** (0.06)	0.172*** (0.05)	0.166** (0.06)
Inflation	0.017* (0.01)	0.015* (0.01)	0.015* (0.01)	0.018* (0.01)	0.015* (0.01)
Unemployment	0.025 (0.05)	0.016 (0.05)	0.008 (0.05)	0.022 (0.05)	0.014 (0.05)
Human capital index, see note hc	-5.694*** (0.89)	-5.177*** (0.91)	-5.296*** (0.94)	-5.158*** (1.01)	-6.676*** (0.95)
Public sector	0.165** (0.06)	0.140* (0.06)	0.137* (0.06)	0.120* (0.06)	0.141* (0.06)
Remittances	-3.625 (6.73)	-0.055 (7.14)	-1.198 (7.11)	-2.932 (7.32)	-4.844 (6.38)
Rural population	-0.049** (0.02)	-0.048** (0.01)	-0.053*** (0.02)	-0.045** (0.02)	-0.041* (0.02)
Commodity boom (2003-2013)	-0.844* (0.34)	-0.844** (0.31)	-0.906** (0.32)	-0.824** (0.31)	-0.838** (0.31)
Constant	53.800*** (3.10)	54.642*** (3.01)	54.865*** (3.25)	56.007*** (3.03)	57.812*** (2.82)
R-squared	0.960	0.959	0.959	0.958	0.960
N	331	331	331	331	331.000

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

Table A3.10: Prais Winsten regressions: small sample

	Model A3.26	Model A3.27	Model A3.28	Model A3.29	Model A3.30
	b/se	b/se	b/se	b/se	b/se
Primary goods exports	6.154*** (0.97)				
Agriculture exports		16.853** (5.39)			
Food exports			2.888* (1.30)		
Fuels exports				-4.572*** (0.92)	
Ores and metals exports					4.005** (1.40)
Left legislative seats	-2.347** (0.86)	-2.607** (0.91)	-2.418** (0.90)	-1.122 (0.87)	-2.486** (0.91)
Electoral democracy	8.296*** (1.80)	8.845*** (1.93)	8.661*** (1.98)	8.187*** (1.82)	9.053*** (1.99)
Capital account openness	0.155 (0.12)	0.216* (0.13)	0.210* (0.13)	0.229* (0.11)	0.195* (0.12)
Trade openness	-0.004 (0.01)	-0.015 (0.01)	-0.005 (0.01)	-0.008 (0.01)	-0.005 (0.01)
FDI inflows	0.071 (0.06)	0.112* (0.05)	0.109* (0.05)	0.093* (0.05)	0.073 (0.05)
Economic growth	-0.005 (0.02)	-0.003 (0.02)	-0.012 (0.02)	0.001 (0.02)	-0.007 (0.02)
GDP per capita	0.255*** (0.03)	0.220*** (0.04)	0.243*** (0.05)	0.210*** (0.04)	0.195*** (0.05)
Inflation	0.013 (0.01)	0.013 (0.01)	0.011 (0.01)	0.015* (0.01)	0.008 (0.01)
Unemployment	0.162** (0.05)	0.135* (0.06)	0.136* (0.06)	0.194*** (0.05)	0.141** (0.05)
Human capital index, see note hc	-5.993*** (0.99)	-3.343*** (0.99)	-4.198*** (1.02)	-4.314*** (1.00)	-5.389*** (1.17)
Public sector	0.167* (0.07)	0.104 (0.07)	0.077 (0.07)	0.086 (0.07)	0.093 (0.07)
Remittances	22.408 (16.26)	6.085 (15.11)	7.973 (15.14)	10.372 (15.75)	7.875 (15.32)
Rural population	0.115*** (0.03)	0.155*** (0.03)	0.139*** (0.03)	0.162*** (0.03)	0.148*** (0.04)
Commodity boom (2003-2013)	-0.990* (0.46)	-0.947* (0.41)	-0.988* (0.40)	-0.838* (0.40)	-0.965* (0.39)
Constant	44.574*** (3.72)	41.233*** (3.87)	43.106*** (4.05)	45.136*** (3.78)	46.647*** (4.20)
R-squared	0.973	0.973	0.973	0.975	0.974
N	184	184	184	184	184

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.10$

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