

# Friendly Panda or Roaring Dragon?<sup>1</sup>

Assessing whether trade with China increases Latin American countries' commodity  
dependence

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<sup>1</sup> Title borrowed from Harris (2015).

## **ABSTRACT**

Numerous studies point to the negative effects of commodity dependence. While dependency theorists claim that commodity dependence keep developing countries in a state of constant underdevelopment, neoclassical economists claim that commodity dependence is a necessary strategy for labour- and resource-rich economies to develop over time. Over the last decades, we have seen an increase in Sino-Latin American economic relations, and there are those who claim that this relationship is leading Latin American countries (henceforth referred to as LACs) to become more commodity dependent. But I argue that this discussion has yet to reach an agreement, and with my thesis I seek to help clarify this debate. Using data on Latin American commodity exports and natural resources rents<sup>2</sup>, I have implemented a three-section panel data regression analysis of 22 LACs in the time period 1990-2019. I have based the assumptions of my analysis on the Dependency theory. My key findings lend support to Dependency theory, in that they indicate that trade with China has a modest effect on commodity dependence, which is overshadowed by that of trade with the USA. Thus, if China is slowly replacing the US hegemony in Latin America, China has a long way to go. My findings illustrate the need for further research on the topic, particularly 1) the effect of commodity dependence on economic development, 2) how domestic institutions affect LAC natural resources management, and 3) how other Chinese (and US) economic activities in Latin America might affect commodity dependence in the region.

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<sup>2</sup>LAC commodity exports of total exports data is from ECLACSTAT, and Total natural resources rents % of GDP is from World Bank. Use of the data is the responsibility of the author of this thesis. All potential mistakes or errors in application of the data is the responsibility of the author of this thesis.

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## LIST OF ABBREVIATIONS

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BRICS – Brazil, Russia, India, China, South Africa  
CACM – Central American Common Market  
CAT – Comparative Advantage Theory  
DV – Dependent Variable  
ECLAC – Economic Commission for Latin America and the Caribbean  
EU – European Union  
FDI – Foreign Direct Investment  
FTA – Free Trade Agreement  
GDP – Gross Domestic Product  
HDI – Human Development Index  
HHI – Hirschman-Herfindahl Index

IMF – International Monetary Fund  
ISI – Import Substitution Industrialization  
IV – Independent Variable  
LAC – Latin American Countries  
LAFTA – Latin American Free Trade Area  
LAIA – Latin American Integration Association  
MNC – Multinational Corporation  
MOFCOM – Chinese Ministry of Commerce  
NAFTA – North American Free Trade Agreement  
ODI – Outward Direct Investment  
PPP – Purchasing Power Parity  
SITC – Standard International Trade Classification  
SSAS – Sub-Saharan African States  
TradeCAN – Trade Competitiveness Analysis of Countries  
UNCTAD – United Nations Conference on Trade and Development  
UNDP – United Nations Development Programme  
UNSD – United Nations Statistical Division  
USA – United States of America  
WITS – World Integrated Trade Solution

# Friendly Panda or Roaring Dragon?

## Assessing whether trade with China increases Latin American countries' commodity dependence

*The United States is no longer our privileged partner. Now the privileged partner is China.*

- Ricardo Patiño, former foreign minister of Ecuador.

*Subduing the enemy without fighting is the acme of skill.*

- Sun Tzu

*Napoleon Bonaparte once said that China “is a sleeping lion,” and “when China wakes up, the world will shake.” In fact, the lion of China has awoken, but what the world sees now is a peaceful, amiable, civilized lion.*

- Xi Jinping, March 2014

*Given the choice between the onerous conditions of the neoliberal Washington Consensus and the no-strings-attached largesse of the Chinese, elevating relations with Beijing was a no-brainer.*

- South American diplomat (Jenkins 2019, 246).

*Commodity dependence may not make the headlines of newspapers, but its effects do.*

- Pamela Coke-Hamilton, World Economic Forum

## 1 INTRODUCTION

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Commodity dependence, the phenomenon in which a country's export share consists chiefly of primary products, is a prevalent phenomenon in most countries in the world. According to a 2019 UNCTAD report, 102 of 189 countries (54%) experienced commodity dependence. Most of the countries experiencing commodity dependence are developing (64%) or least-developed (85%) countries. Meanwhile, only 13% of developed countries are commodity dependent. Globally, the quantity of commodity dependent countries has increased over the last 20 years. A 2019 UNCTAD report found that between 2013 and 2017, 17% of all commodity-dependent countries could be found in Latin America (UNCTAD 2019). More startling is a finding by a 2021 UNCTAD report: in 2019 all 12 Southern American countries



were considered commodity dependent! Surely, commodity dependence in Latin America is nothing new: it can in fact be traced back to colonial times, but Latin America did experience a certain extent of industrialization and economic diversification in the 20<sup>th</sup> century (e.g. Argentina, Brazil). However, since liberalizing its economies and exposing themselves once again to international markets (including China), many LACs have seen a ‘re-commodification’ (i.e. the increasing economic dependency of LACs economies on commodities as source of economic growth) of their economies.

In this section I seek to explain my thesis question, the essence and purpose of my thesis, and lastly the contents of my paper before I move on to other sections. Now, what makes commodity dependence significant? Well, first I should probably clarify what a commodity is. A commodity in this context refers to lower value-added materials such as copper, iron, soy and fishmeal (Radetzki and Wårell 2021, 28-29). Commodities differ from higher value-added manufactured goods (e.g. machinery, steel and chemicals) and high-tech products (computers, pharmaceuticals, electrical machinery etc). Noted, there is an argument to be made that one should separate between fuel commodities (e.g. natural gas, oil) and non-fuel commodities (e.g. metals, agriculture). For instance, real oil prices increased by 780% between 1970 and 2018 (2021, 72-73), and in other words oil is considered high value-added. However, in this assignment, due to restricted space, I will not discriminate between commodities. As the term commodity can be used to mean both ‘general’ and ‘primary’ products, I would like to clarify to my reader that in this paper I will use the term exclusively to mean primary, unprocessed products, as indicated above. Further, the term ‘value-added’ signifies the difference between the cost of producing a product or service, and the final sales price of that product or service.

A country would be considered commodity dependent “when more than 60 per cent of its total merchandise exports are composed of commodities” (UNCTAD 2019). So what makes commodity dependence consequential? There are differing opinions about its effects; while Dependency theory argues that commodity dependence leaves a country in a situation of persistent underdevelopment, Neoclassical economics argue this is a necessary, even beneficial state for countries to exploit their resources for economic growth. Over the last decades, LACs have increased their economic relations with China, and there are those who argue that by importing mainly natural, unprocessed goods (i.e. commodities) from LACs, China is promoting the commodity dependence of Latin America. Thus, in this paper I

address the potential implications of the Chinese presence in Latin America. My thesis seeks to answer the following question:

*Is Sino-Latin American trade exacerbating Latin American commodity dependence?*

So why would I investigate the effects of trade with China? What makes China a unique and interesting country of analysis? Surely the USA has historically and continues to this day to be of more significant influence on the Latin American economy. It should be clear by now that China has risen to become one of the most powerful countries in the world. And to support this ever-rising power, China has made a habit of importing commodities from Africa and Latin America. As China is set to become the world's leading economy by 2024, or even this year (in PPP it already is!), it is imperative to understand the nature of China's activities in this region. And while the Chinese international economic ventures are nothing new (e.g. Africa), and US presence in Latin America is nothing new, Chinese presence in Latin America is, although relatively new, an increasingly common occurrence. In fact, for the last 30 years, China has had an increasing investment with Latin America, which is in many ways a mutually beneficial partnership (Wise 2020; Jenkins 2019, 224). For China, Latin America possess the necessary commodities needed by China to fuel its impressive growth and export-led development model.

In addition, Latin America represents a favourable market for Chinese products, in addition to loans and FDI. This would then reduce China's dependence on North American and European markets for its products. Further, doing business in Latin America can enable Chinese companies to develop as international competitors against Western multinationals (Jenkins 2019, 239-240). Still, it remains controversial which intensions China has on the Latin American continent (Carvalho 2019; Harris 2015, 153; Banik and Bull 2018, 536). Some, including the USA, not only argue that China is provoking developing countries towards commodity dependence, but also that they have great power ambitions to replace US influence in Latin America. And lastly, increasing ties with LACs could help China isolate Taiwan politically, although some later developments would indicate this point is of decreasing importance to China when it comes to trade and investments with LACs (Ellis 2009, 9; Jenkins 2019, 248).

For Latin American countries, China offers an essential market and represents a prospective investment capital partner, in addition to providing a chance for LACs to gain political independence from USA and Western international bodies (Ellis 2009, 1). China is, after all, unlike Western countries and international organizations, committed to its policy of non-interference, an argument which is particularly attractive to neoliberalism-sceptic left-wing governments. And in truth, Latin America has experienced significant economic growth through trade with China. Perhaps it is no wonder, then, that increasing business ties with China is now a crucial subject on the national agenda of many Latin American countries. Furthermore, the Sino-Latin American relationship has also involved cultural, political and social initiatives, involving diplomatic visits by heads of state, cultural programs and sister-city relationships (2009, 3). Now, it is true that the implications of Sino-Latin American trade on LACs and their commodity exports dependence are increasingly more prevalent in academic literature, which I will cover more in my literature review section.

However, at the current time, academics stand divided on the subject. My assignment might clarify this relationship further. In addition, as stated by UNCTAD, it is highly essential to keep an eye on the spread of commodity dependence around the world, since this phenomenon can have a significant negative effect on the economic development of these countries (UNCTAD 2019; Bulmer-Thomas 2003, 13-14; Brown 2015, 385-386). And finally, as developing countries have been unproportionally covered in international relations research (especially Latin America, which has somewhat unfairly been labelled the 'peripheral' continent), my paper might contribute to even out this unbalance (Burnell, Rakner and Randall 2017, 73).

Now, despite its positive aspects, the Sino-Latin American relationship does not come without its downsides. First of all, at the international level, there are those who argue that China has great power ambitions to replace US influence in Latin America. Therefore, I seek to compare the effects of trade with China and the USA on LAC commodity dependence, as USA has historically been considered the hegemon in the region. Second, on the more regional level, I have already mentioned that the Sino-Latin American trade relationship may exacerbate commodity dependence. It is therefore argued that Latin America's growing trade relationship with China can have significant long-term effects on the development and political stability of Latin America (Castañeda 2017, 2; Ellis 2009, 4). If my research does indicate that trade with

China is increasing Latin American commodity dependence, it is interesting to ask how this affects Latin American development.

My theoretical arguments will be tested through a three-part panel data regression analysis which includes 22 LACs in the time period 1990 – 2019. The focus of this investigation will be based on the Dependency theory, contrasted with the Neoclassical Economics and the Comparative Advantage theory (CAT). And so, in this section I have sought to present my thesis question, in addition to explaining the essence and purpose of my thesis. The rest of the paper is structured as follows: In the next section I will clarify some concepts which I utilize in this text that may otherwise seem unclear. In the third section, my literature review, I will go through the current discussion in the academic literature relevant to my subject. Included will be the scholarly debate on commodity dependence and its impact on national economies, the effects of Chinese trade on LAC commodity dependence, and Chinese ambitions as an international superpower rivalling the historic hegemon in Latin America, USA.

This section will also illustrate the need for further research, where my paper intends to clarify some key debates. My fourth section will entail my theory. This part starts with my theoretical arguments and ends with my testable hypotheses. Here I will go through the two opposing theories Dependency theory and Neoclassical economics (Ocampo 2017, 52), as they will function as the main theories I utilize as a framework when discussing my analysis results. The fifth section is my method chapter, in which I will present my research design and justify my analytical choices. My sixth chapter elaborates on my variables, including my DVs, IV and CVs. In the seventh section I will present my results, and in my eight chapter, I will discuss these findings. Then, finally, section nine brings me to the conclusion. Due to the restricted nature of this assignment, I will limit myself to the economic (and partially geopolitical) scope. For the same reason, I will not analyze the impact of commodity dependence on economic development in the region. But before I move to the literature review, I would like to share with you some core features of Latin American economic development. The purpose is to provide my readers with a contextual framework in which to better understand the literature on the present-day Latin America and its relation to commodity dependence.

## **1.1 LATIN AMERICAS ECONOMIC DEVELOPMENT: SOME CORE FEATURES**

So far, I have provided an introduction on purpose of my thesis, which is assessing determinants of commodity dependence in Latin America. However, in the effort of providing my readers with a better understanding of the phenomenon commodity dependence in Latin America, I will now provide a quick economic history of Latin America, for the sake of context for the recent developments. What should be evident, is that, ever since colonial times, Latin America has relied on commodities for economic growth.

### **1.1.1 Primary exports economy (1500 – post WWII)**

When colonizing the New World, the European colonizers installed extractive institutions serving solely to withdraw its natural resources to the home country. This characterized the Latin American colonial period, and these institutions were transferred to the newly independent Latin American countries in the beginning of the 1800s. Independence co-occurred with wars and uncertainty, and preserved elite interests, and thus did not provide proper foundations for economic growth. The European elites, armed with extractive institutions, had little to gain from industrial modernization. Economic growth, it was believed, would come through exports (particularly of precious metals) (Bulmer-Thomas 1994). As Franko argues, “A nation’s institutions may continue to be influenced by its colonial past” (2007, 38).

All through the 1800s and 1900s, Latin America expanded its commodity-based economies to be integrated into the world economy. But even in the ‘golden age’ of primary product exports, 1870-1913, “Single-commodity exports (...) were an unstable basis for balanced, sustainable economic growth”. This was much due to the isolation of the export sector from the domestic market; for example, US multinational corporations dominated the bananas industry without any support for the social advancement of the Latin American countries it operated in (e.g. United Fruit Company in Costa Rica). Demand for the single-commodity exports was mainly decided abroad. Noted, Argentina serves as an exceptional case in Latin America, given that it was one of the world’s richest countries in the beginning of the 1900s (Glaeser, Di Tella and Llach 2018, 1).

### **1.1.2 Import Substitution Industrialization (ISI) (1950s – 1970s)**

In the aftermath of, and largely as a consequence of the two world wars, Latin America entered a phase of inward looking, state-led industrialization, so-called Import Substitution

Industrialization (ISI). This process involved protectionism, dependence on domestic markets and the region's deteriorating gains in world trade (Tussie 2011, 317). However, this industrialization was undermined by a couple of factors. One factor is that, since commodity export represented a significant part of total export, it was never really replaced. As explained by Tussie of this period: "LA remained all the same extremely vulnerable to fluctuations in the world economy, and especially to the fortunes of commodity exports". And even though LACs experienced significant industrialization, commodity exports share of total exports were still considerably high (2011, 318-319). This commodity dependence put Latin American countries in an economically vulnerable position, demonstrated by domestic (e.g. economy policy discrimination) and external factors (e.g. oil products were hurt by Middle Eastern oil boom). Another reason is that the state-led industrialization impeded foreign direct investment (FDI) in natural resource and infrastructure sectors in many countries, which therefore gave room to the increasing role of state-owned enterprises (SOEs). The once so exceptionally rich Argentina experienced a stagnating, and then declining economy in the 1970s (Glaeser, Di Tella and Llach 2018, 2).

### **1.1.3 The neoliberal market economy: 'The Washington Consensus (1980s – present)**

The 1980s saw the consequences of the Latin American dependence on commodities as a source of exports; a collapse of commodity prices, partly responsible for the Latin American debt crisis, and market reforms in certain countries (e.g. Chile) led Latin America to an economic crisis. As a result, many nations looked to international bodies such as the World Bank, IMF and the USA for loans to service their debts. In return for loans, these actors demanded economic reform in LAC involving, among others, trade liberalization, privatization, de-regulation, regional trade agreements and tax reforms. LACs were now officially being integrated into the multilateral system. This was to be termed the 'Washington Consensus' (Heywood 2014, 96; Perkins, Radelet, Lindauer and Block 2013, 146-147; Tussie 2011, 318). In addition, the LACs sought to diversify exports from commodities to manufacturing goods. Mexico, for example, joined NAFTA with the goal of moving exports away from commodities to natural resource-based manufactures.

In 1991, MERCOSUR was created to encourage diversification and re-establish regional integration processes (first attempted in the 1960s with LAFTA, Andean Group and the CACM). As a result, the 1990s saw the increase of intra-regional trade of manufacturing and high-tech goods. The majority of LACs had by the 1990s carried out extensive trade

liberalization. Tussie argues that the trade liberalization strategy has been ‘disappointing’, while Birdsall, De La Torre, and Caicedo refer to their outcomes as ‘disheartening and puzzling’, primarily due to ‘premature financial market liberalization’ (2011, 89; 2011, 97; 2011, 321-322). While trade liberalization did lead to increased productivity and economic growth, this growth failed to redistribute resources to low-skilled workers, who now faced the bulk of competition (Lora 2011, 368). And in 1997, the ‘Asian Crisis’ spilled over to Latin America, leaving them in financial turmoil once again.

The Asian Crisis revealed once again how vulnerable developing countries were to shocks from the flawed and volatile international capital market. It is noteworthy that regional trade (through such intraregional organisations like LAIA, CARICOM, the Andean Pact etc) in Latin America boosted trade diversification; reporting in 2011, Tussie argued that “Manufactures total more than 80% of their intraregional trade, whereas the share of manufactures drops noticeably in trade with the rest of the world” (2011, 323). In the 2000s, more and more LACs formed FTAs with countries around the world, in what is known as “trans-continentalism” (2011, 331). In fact, ‘extraregional trade’ was much more prevalent in LACs than ‘intraregional trade’. One important development in this phase is that the export share to USA has declined, while commodity exports (particularly oil, agricultural and mineral products) share to China has increased (e.g. Argentina, Chile, and Peru) (2011, 332-333). This latter observation is particularly interesting for my analysis, in which I will compare the effects of commodity exports to China vs USA on LAC commodity dependence.

#### **1.1.4 Recent effects of commodity dependence on Latin American economies**

Amplified by demand from the commodity price boom and increasing Sino-Latin American trade, Latin America experienced a ‘re-primarisation’ of exports in the early 2000s (Ocampo 2017, 51; Svampa 2019, 12). Due to the growth and demand of many market economies, including China, we have in recent decades seen a rise in commodity prices – many commodities which are possessed by Latin American countries, such as iron, gas, soybeans, copper and oil. As a result, many Latin American countries have profited substantially from trading with these economies, maybe most significantly from China. LAC per capita GDP growth rates rose to unprecedented levels, leading to bettered current account balances, reduced foreign debts and prompted sizeable capital inflows and massive acquisitions of foreign reserves. This economic improvement allowed LACs to employ suitable countercyclical macro policies to reduce the consequences from the 2008 financial crisis

(Bacha and Fishlow 2011, 394-395). However, this blessing is also a curse: Ocampo argues that during the 2003-2013 commodity price boom, Latin America's dependence on lower value-added commodities increased, and LACs have inadequately exploited the advantages of its specialization in natural resources. In fact, these countries have rather more often experienced its negative effects, including Dutch Disease, de-industrialization and commodification of their economies (2017, 51; Carvalho 2019; Ebert and La Menza 2014, 101-102). Writing in 2022, the situation has not changed. Now that I have provided a brief historical context for the present situation, let us move on to what the academic literature says about how commodity dependence affects economic development, and how China is affecting the situation in Latin America.

## **2 LITERATURE REVIEW**

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In the previous section, I gave you a brief introduction into Latin American economic history. What should be taken away from that history, is the fact that commodity trade has been a key part of Latin American economies for centuries. In what follows I will follow this thread, in that I will introduce the current discourse of the academic literature on the subject I am covering. Here I will cover what the literature says on three key developments: (1) which effect commodity dependence has on the economic development of developing countries; (2) whether China is leading Latin American countries towards commodity dependence; and (3) whether China represents a challenge to US dominance in the region. Even though I will not be able to conduct an analysis of the effect of commodity dependence on economic development, it is still important to assess what the literature says on the subject so that we might understand the potential implications that might follow if we are to find important determinants of commodity dependence in Latin America. Further, the third point is significant as I will later compare the effects of Chinese vs American trade on Latin American commodity dependence. Throughout this review, I will examine diverse studies including diverse research methods and time periods.

### **2.1 WHAT EFFECT DOES COMMODITY DEPENDENCE HAVE ON ECONOMIC DEVELOPMENT IN DEVELOPING COUNTRIES?**

The overarching question to my thesis is: *Is Sino-Latin American trade exacerbating Latin American commodity dependence?* But before we deal with the issue of Chinese influence, it is important to ask the question: what effect does commodity dependence have on economic development? I will start with a general overview of what the literature says about the effects



of commodity dependence, before I move on to specific effects that commodity dependence can have on an economy. Then I will embark on a brief economic history of Latin America for the sake of context before I explain the effects that commodity dependence has had on Latin American countries in recent years. According to a 2019 UNCTAD report, commodity dependence is found mainly in developing countries, and Latin America consists exclusively of developing countries. Admittedly, although Latin America consists of only developing countries, it is important to point out that not all of them are poor; in fact, there is a huge economic gap between Latin America's poorest (independent) country, Dominica (with a GDP of \$504.21 million in 2020) and its richest country, Brazil (with a GDP of \$1.44 trillion in 2020) (World Bank 2022).

Today, according to a 2019 UNCTAD report, commodity dependence is found mainly in developing countries. In 2019, about 102 of 189 countries (54%) were commodity dependent. While only 13 per cent of developed countries (e.g. Australia, New Zealand, Norway, etc) were commodity dependent, the number was 64% for developing countries and 85% for the world's least developed countries. A UNCTAD report from 2021 finds that the majority of commodity dependent countries are developing countries; "(...) accounting for 87.1 per cent of the total of commodity dependent countries in the world in 2008-2009 and 86.1 per cent in 2018-2019". In fact, "In 2018-2019, 87 out of 136 developing countries were considered commodity dependent (...)" (UNCTAD 2021). Thus, it may not be a surprise that "export concentration on primary commodities, or 'commodity dependence', has long been conceptually and empirically linked with underdevelopment" (UNCTAD 2019). As my assignment focuses on Latin America, it is interesting that the commodity dependence there increased in the time period 2008-2019 (remember my earlier statement about all 12 South American countries being commodity dependent in 2019). This is an interesting development, given that up until the 1980s, Latin America was considered markedly industrialized. But I will get back to that topic later. Now, we know that developing countries carry the brunt of commodity dependence, but what does the literature say about the effects of commodity dependence? Is it advantageous or disadvantageous for an economy? As I will elaborate on below, the negative effects seem to outweigh the positive ones.

### **2.1.1 Economic instability, volatile prices and poor terms of trade**

Evidence suggests that primary export-led economies grow slower than countries with limited resources. Coke-Hamilton (2019) argues that commodity dependence is a 'state' which is linked with instability and poverty and has serious detrimental effects on the country's future economic prospects. Deutsche Welle (2021) echoes this view, arguing that commodity dependence is heavily linked with low technological development, in addition to poor labour productivity and productivity growth. Indeed, the 2019 UNCTAD report on commodity dependence has two ultimate findings; first, that commodity dependence is primarily found in developing countries, and second, that once a country suffers from it, it is hard to escape. In fact, through a study over 1995-2018, UNCTAD (2021) finds that 95 % of countries that were not commodity dependent remained in that condition. Meanwhile, out of the strongly commodity dependent countries, 92 % remained in this situation. Further, a country which is 'strongly commodity dependent' has a 7% chance of reverting back to 'general' commodity dependence. According to Coke-Hamilton, lacking economic diversification and depending on primary products, a country will find itself in a vulnerable situation conditional on international market prices.

The aspect of natural resources that might be of greatest disadvantage for commodity-dependent countries, is the *instability of commodity prices* (Collier 2003, 139, Coke-Hamilton 2019; Humphrey, Sachs and Stiglitz 2007, 325; Bacha and Fishlow 2011, 394). Humphreys, Sachs and Stiglitz (2007) also argue that volatility is a crucial negative quality to natural resource that problematizes dependence on these commodities (Pineda and Rodríguez 2011, 415). In fact, between 2003 and 2010, commodity prices were more unstable than any time since 1960 (Jenkins 2019, 257). Commodity prices generally increased from 2002-2013, while significantly declining in the time period 2013-2017 (Castañeda 2017, 8; UNCTAD 2021). A study by Humphrey, Sachs and Stiglitz confirms the volatility of commodity resources. Bacha and Fishlow in fact coin the term 'stop/go long term commodity price pattern' (2011, 395). This unstable economic environment also has a negative effect on foreign and domestic investment (Collier 2003, 149).

The reason why the prices of these commodities are volatile, is because commodity exports don't necessarily nourish growth at the desired rate, wages are fluctuating, commodity prices are declining, linkages are broken, and its fiscal fortunes often lead to corruption and civil conflict more than economic development. Further, commodity dependence is associated with

declining terms of trade over time, leading to worsened prospects for economic development (Tussie 2011, 319). What we then observe, is that when a country emphasizes its profits on boosting the commodity sectors, this leads to declining terms of trade, again leading to declining profits for the country. In other words, this relationship between terms of trade and commodity dependence seems to form a vicious cycle. Noted, there are diverse theories attempting to explain the dynamics of commodity prices (e.g. destabilizing speculation, the ‘overshooting’ model) (Frankel and Rose 2009). However, the causes of these market dynamics are not well understood, as explained by Wang (2008). And it would be wrong to categorize commodities as a single, undivided resource, as they have unique, individualized, and irregular characteristics (Brooks and Prokopczuk 2013, 527; Bacha and Fishlow 2011, 395).

### **2.1.2 Depletion**

The following is very much related to the volatility of international commodity prices. When a commodity dependent country experiences a boom in commodity prices, they tend to either spend the profits on public expenditure or boosting more production of the commodity in question rather than diversifying their economy to protect themselves in the case of falling commodity prices. When there inevitably is a bust, and there is no longer a strong international demand for the commodity, it “drag the whole economy down with them – because the commodity has essentially become the economy (...)” and the country suddenly finds itself in a fragile economic situation, which might lead to an economic crisis. Exports revenues shrink, leading to a fall in the country’s revenues, which prompts budget cuts, which then hurts exports, employment, infrastructure, social spending, education and so on.

Needless to say, under such conditions, the public decision-making process is highly convoluted. This unstable economic management in fact worsens the fluctuation effects. This tendency is supported by Rodríguez and Sachs (1999) and Sachs and Warner (2005) (Bacha and Fishlow 2011, 398; 2011, 400; Pineda and Rodríguez 2011, 415; UNDP 2010). To add insult to injury, this economic instability frightens foreign investors (Pineda and Rodríguez 2011, 415; UNDP 2010). Maybe the most important detriment is that the profits needed to diversify the economy and reduce commodity dependence is now gone. Therefore, commodity dependence is a ‘vicious cycle’. Thus, what we are often witnessing is a resource curse: a situation in which a country has poor economic development despite having access to

abundant valuable natural resources (Fernando 2020; Chen 2019; Rochon and Rossi 2016, 265; Jenkins 2019, 257). Studies made by Sachs and Warner support this view (Pineda and Rodríguez 2011, 414-415). One strong example of an LAC with a natural resource curse is Argentina. Post-1980s Venezuela indicates the same development (2011, 419).

### **2.1.3 Dutch Disease: deindustrialization**

Some argue that investments in natural resources of which a country possess most of at the expense of other sectors will lead to a “de-industrialization”, also called “Dutch Disease”: when domestic resources are focused on commodity-based sectors, the real exchange rate tends to appreciate (although it is uncertain whether this is directly because of commodity exports), the terms of trade seem to decline, and consequently, manufactures and other sectors lose competitiveness and are weakened, even removed from international and domestic markets. Furthermore, investments in development are ignored (Bacha and Fishlow 2011, 395; Rochon and Rossi 2016, 265). Why is the decline in non-commodity sectors an issue? That is because industry and manufacturing promote investments in more advanced technology and increased productivity and living standards in the long run. Evidence does in fact show that developing countries with abundant natural resources are inclined to grow slower than those who export manufactures (2011, 397-398).

A 2003 study by Ocampo and Parra, estimating the relative price series for 24 primary products throughout the 1900s find that natural resource abundance leads to declining, short-run terms of trade (Pineda and Rodríguez 2011, 414). This is troubling, given that evidence indicates that economic development in developing countries with abundant natural resources are inclined to grow slower than those who exports manufactures. This would again imply a resource curse (Chen 2019). A cross-sectional study made by Sachs and Warner, where they used the proportion of GNP composed of primary products to measure growth support this view. They find that resource-abundant countries grow slower than ‘resource-scarce’ countries (Pineda and Rodríguez 2011, 414). The implication is that it is not the natural resources in themselves that lead to commodity dependence, but the poor, short-sighted economic management. It is argued that if the government uses the profits from the primary sectors to diversify its economy to ensure a steady income, they can avoid a negative growth rate.

A failure to diversify their economies will very likely increase the tendency to depend on certain commodity exports, depressing other domestic industries, leaving these countries in a vulnerable position towards trade shocks, not being able to reduce the inequalities provoked by international asymmetries (2012, 339). UNCTAD states that if countries do not ‘take strong action’, they will stay commodity dependent for centuries. A case in point of the negative effects of commodity dependence is the recent fall in commodity prices: after reaching significant heights in 2008-2010, these prices fell considerably in the time period 2013-2017. This sudden decline in prices led to an economic downturn in 64 commodity dependent countries, in which many of them went into a recession.

These countries had to reduce or eliminate investments in infrastructure, social protection, education, etc (UNCTAD 2021). Further, public debt increased, which in turn led to external debt. Demonstrably, in the period 2008-2017, 25 commodity-dependent countries experienced a rise in external debt of more than 25% of GDP (in Mongolia, the number rose from 39% to 245%!). In contrast, manufactures are known to lead to a more accelerated productivity growth, with more employment, more stable export profits, and therefore manufactures (unlike commodities) avoid declining terms of trade. Recently, the combined rise in commodity demand from China and the slowdown of world economic growth has led to an increase in commodity prices on the international market. This has been positive for LACs in the short run, but whether it is beneficial for them in the long run, depends on how the profits from their commodities are spent.

#### **2.1.4 Price and income inelasticity**

The fourth issue is the price and income inelasticity of primary products (especially agricultural goods), in what is referred to as Engel’s law: when the price of a commodity (e.g. coffee, sugar) increases, people only slightly reduce their consumption of this product. However, if the price of the commodity decreases, people only slightly increase their consumption of this good. This is in contrast with manufactured goods, which is highly price and income elastic. What this means for the shrinking terms of trade is that elevated levels of growth in the commodity sector may be an insufficient facilitator for economic development (Franko 2007, 43-44).

### **2.1.5 Institutions and governance**

Fifth, many argue that good institutions and governance are key to assuring a diversified economy. Before I discuss the literature on this relationship, it might be wise to briefly cover the relation between institutions and governance. Governance can be defined loosely as “(...) the traditions and institutions that determine how authority is exercised in a country” (Dellepiane-Avellaneda 2010, 195). And institutions in this setting can be interpreted as bureaucratic capacity, corruption, safeguarding property rights, and rule of law (2010, 199). Bakwena indeed finds that the resource curse decreases with increasing institutional quality (2013, 24). In line with this argument, a study by Boschini, Pettersson and Roine indicate that combined with good institutions, resource abundance is not a curse, but a benefit (2007, 614). There is also sufficient literature on the consequences of resource wealth in the absence of good institutions. Observing African countries, Collier argues that commodity dependence can provide governments profits outside of taxation.

This sets a destructive precedent in that governments do not depend much on taxation, and therefore do not have a strong incentive to follow the will of the people. Wantchekon (1999) in fact finds “that natural resources negatively impact democracy”. Still, in the presence of a strong rule of law, well-distributed political power and supervision of the natural resource wealth, this phenomenon is much less likely (Norway is an example). Another scary finding from Wantchekon is that when resource dependence is high (90%), further increased resource dependence has a significant, strong negative effect on democracy. Tornell and Lane (1999) claim that “point-source” resources like oil, certain mineral resources, plantation crops, coffee and cocoa can lead to rent-seeking behavior and generally undermine institutional quality and growth (Bacha and Fishlow 2011, 398-399).

This necessitates the lack of robust legal and political institutions and presence of multiple power groups (e.g. labor unions, parasitic provincial governments) (Pineda and Rodríguez 2011, 416-417; UNDP 2010; Bacha and Fishlow 2011, 398-399). Collier and Goderis suggest that high oil and mineral prices have negative effect on long-run growth in exporting countries with bad governance, but a positive effect in exporting countries with good governance. Sadly, there are quite a few countries in Latin America with poor governments and an abundance of commodities like oil, cocoa, coffee and minerals. Still others argue that resource abundance is not necessarily negative for GDP per capita or human development, but rather that some countries, including many in Latin America have not fully exploited the

opportunities offered by their stock of natural resources (Pineda and Rodríguez 2011, 412). I will test the effect of institutional quality on total natural resources rents share in my analysis section.

### **2.1.6 Famine**

A sixth consequence of commodity dependence might be famine. In his book, Reinert (2008, 149) points out the somewhat ironic fact that countries which predominantly relies on agriculture products as a source of economic growth have the highest likelihood of experiencing famine. This is because an increasing reliance on commodities would imply an insufficient (or entirely absent) relocating of exports profits to the non-export part of the economy.

So far, I have reviewed the academic literature with regards to the effects of commodity dependence on economic development. And I will now finalize with Coke-Hamilton stresses that a country must diversify its economy to stay less reliant on international commodity prices. This is a view supported by Collier (2003, 139) and Bacha and Fishlow, the latter who argue that the domestic policy choices made determine whether natural resources wind up a blessing or a curse (2011, 408). Ocampo and Ros argue that economic diversification would lessen the dependence on the fluctuating revenues deriving from commodities, and therefore stabilize the revenue source for the country. Collier agrees with this point (2003, 139).

### **2.1.8 How commodity exports and natural resources abundance does not necessarily lead to commodity dependence**

It is important to point out that being a primary-product exporter does not necessarily inhibit a country from development; countries like Norway, Sweden, Australia, New Zealand, Canada and the United States all developed on the basis of their commodity exports (Bacha and Fishlow 2011, 397-398). These countries used the profits from their primary exports to invest in other sectors, including manufacturing and industry. Thus, they reduced their commodity dependence – with their commodity profits. And as their populations grew, the wealth of natural materials shrank, and, as a consequence, exports slowly became diversified as the proportion of industry and services exports increased. Other examples of successful export-led economies are the Asian Tigers (i.e. Hong Kong, Singapore, South Korea, and Taiwan).

Admittedly, in contrast to the Western countries and the Asian Tigers, most commodity exporters, largely in Africa and Latin America, have a history of poor growth. Thus, there must be another region-specific explanation for the poor growth of these countries rather than simply being a commodity exporter. Some argue this is due to their strong supply capabilities (i.e. transport infrastructures, macroeconomic stability, inter-sectoral diversification) and access to foreign markets (Fugazza 2004, 1; 2004, 41-42). The evidence is inconclusive on the resource curse. A 2010 UNDP report finds that in the time period 1970–2005 natural resource abundance was positively correlated with increases in human development. Norway’s Petroleum Fund and Chile’s Copper Stabilization Fund are cases in point. It has been argued that resource curse has been the cause of the bad development of Latin America, but the region has observed a couple of cases natural resource abundance combined with strong performance. Rather it may be due to missed opportunities (UNDP 2010). Ros argues that the issue is a lack of industrial linkages; when they are present, natural resources can be a blessing for a country’s economic development.

Following this train of thought, Ferranti et al. (2002) and Lederman and Xu (2007) claim that it is possible to diversify into more advanced sectors (e.g. industry, service) from a solid primary sector, demonstrated by countries like Australia, Sweden and USA. From this view, the curse is one of export concentration (not one of export good category) and inability to transfer from the sectors due to international demands and the principle of the comparative advantage. This perspective is shared by Lederman and Maloney (Pineda and Rodríguez 2011, 415-416). Van Wijnbergen (1984) argue that commodity-rich countries should invest in human capital to avoid Dutch Disease, Wantchekon (1999) proposes a “resource fund” (like Chile and Norway), and Collier and Gunning (1996) advocates sharing the resource profits with the population (Pineda and Rodríguez 2011, 418). Thus, the indication is that the fault lies with institutional problems and government policies, backed by studies from Lederman and Maloney (2007) and Wright and Czelusta (2007). And in truth, some developing countries have managed to diversify their economies, including Egypt, Cameroon, Rwanda, and, maybe more relevant in our case: Brazil and Colombia. The latter two have substantially invested in their manufacturing sectors. This lends credence to the notion that Latin American countries differ significantly in their economic development and commodity dependence. And, if economic diversification doesn’t work, one can try to live with commodity dependence “more successfully”: by easing macroeconomic price shocks, improving the



management of commodity revenues, and mitigating the conflict risk provoked by commodity dependence (2003, 140; 2003, 155; 2003, 155-158).

Finally, it is important to mention that while the Western world has experienced ‘sluggish’ growth since the financial crisis of 2007-08, most developing countries were not as affected by that crisis (mostly as commodity prices remained high due to persistent demand from Asia, principally from China and India), and are emerging political and economic powers on the world stage (especially the BRICS countries Brazil, Russia, India, China and South Africa). Indeed, these economies have grown to be progressively valuable trade and investment associates for less-developed countries – an increasing trend. Along with alternative regional markets like CARICOM (Caribbean Community and Common Market) and ASEAN (Association of Southeast Asian Nations), newly established international institutions such as the New Development Bank (NDB) and the Asian Infrastructure Investment Bank (AIIB) have been established with the purpose of paralleling the IMF and the World Bank. And who knows, these may grow to challenge the global domination of the Western powers and the Bretton Woods institutions. They may attempt this goal by offering developing countries alternative sources of alliances and financial support, prompting an increasing ‘North-South conflict’.

Admittedly, as China is still considered a developing country, this would technically make for a South-South export structure. But there might nonetheless be a storm on the horizon for China; its economic growth has stagnated, leading to a decrease in global demand (and thus falling prices) for commodities, which may destabilize commodity-dependent economies in the developing world (Burnell, Rakner and Randall 2017, 69-70; 2017, 82-83). To sum up: there are a lot of ways in which commodity dependence can affect economic development. Its potential negative effects range from volatile prices, Dutch Disease, resource curse, famine, and price inelasticity. However, the literature also indicates that the problem is not natural resource abundance in itself, but rather institutional weaknesses. If a country utilized the profits from its primary exports to diversify its economy, commodity dependence does not necessarily have any negative effects. Developed countries such as Australia, Norway and the United States are excellent examples of this. Thus, to sum up: the over-riding conclusion from all these studies is that commodity dependence, in combination with weak institutions tend to have a negative effect on a developing country’s economic development. However, there are ways to escape it, the most prominent one being economic diversification. I will now take you

through a brief economic history of Latin America, for the sake of context for the subject of which I am writing.

## **2.2 DOES CHINESE TRADE LEAD LATIN AMERICAN COUNTRIES TOWARDS COMMODITY DEPENDENCE?**

The literature is far from conclusive on this subject.

### **2.2.1 Increased Sino-Latin American economic relations**

Some would attribute the ‘recommodification’ of Latin America to the Sino-Latin American economic relations that have been growing since 1990. In fact, “Between 1999 and 2014, China’s imports from Latin America increased more than forty-fold, and exports to the region more than twenty-fold”. And from 2014 to 2019, despite falling commodity prices between 2013 and 2017, LAC exports to China rose from 4.5% to 10% in value. However, their relations have not been limited to trade; Chinese companies have increasingly gained a foothold on the continent through “FDI, construction and engineering projects, and lending by Chinese banks” (Jenkins 2019, 224). Banco de España Economic Bulletin (“The impact of China on Latin America: trade and foreign direct investment channels”, read 24.02.22) also finds an increase in trade and FDI between China and Latin American countries overall. Trade is however the most important economic activity between these two regions (Jenkins 2019, 224). Writing in 2012, Jenkins argues that China views Latin America as “a source of raw materials, a market for exports of manufactured goods and an area of diplomatic competition with Taiwan” (2012, 1337).

In turn, China provides an essential market and represents a prospective investment capital partner. And in truth, Latin America has experienced significant economic growth due to trade with China. This is largely due to the Chinese demand for LAC primary commodities, which has boosted exports and raised commodity prices globally (Ellis 2009, 1; Jenkins 2012, 1337; Jenkins 2019, 239-240). Further, proponents of this view claim that China values “national sovereignty and non-interference in the internal affairs of other countries” (2019, 236). This latter point might be of most significant importance. There is not a lack of non-democratic regimes in the developing world which prefer a non-interventionist trading partner to the ‘imposing’ Western world. Examples can be found in Latin America; as we are witnessing democratic erosion in countries like Brazil (Stuenkel 2021) and El Salvador (Zovatto 2020) and a nearly outright dictatorship in Nicaragua (Flannery 2021) and

Venezuela (Berg 2022), one might ask whether China will fill the void that Western countries leave after them if refusing to cooperate with nondemocratic countries.

And China deals with both US-friendly (e.g. Chile, Peru) and US-hostile (Venezuela, Ecuador) countries. Demonstrably, China distanced itself from Hugo Chavez's US-hostile rhetoric (2019, 252). And one should be careful to assume that China is pushing itself onto Latin American countries; for example, its attractive loan rates in comparison to the international financial markets suggest that it is a mutually beneficial relationship, where both sides willingly form partnerships. Admittedly, one political factor seems to affect Chinese investments (at least until recently): the Taiwan question. Although not affecting trade, China has been reluctant to invest loans or FDI in LACs which recognizes Taiwan as a separate country. For example, when Costa Rica abandoned recognition of Taiwan in 2007, China purchased US\$300 million Costa Rican government bonds and invested US\$20 million in aid for reconstruction after a recent flood. I will therefore not include the 'Taiwan factor' into my analysis, as Jenkins finds that it does not affect trade.

### **2.2.2 'The Roaring Dragon': China and Latin American Recommodification**

However, there are those who argue that economic relations with China do in fact result in recommodification. The Trump administration criticized Chinese companies for damaging LACs "by investing mostly in the extraction and transportation of its precious raw materials", leading to an increased dependence on commodities. At the same time, LACs tend to import low, medium, and high technology manufactured products from China, including cars, computers and machinery (Jenkins 2019, 227; Castañeda 2017, 2). In other words, there seems to be a pattern of "trade of commodities in exchange for manufactures between China and Latin America", which is likely to continue for decades firstly due to LAC trade surpluses with China in agriculture, and, secondly, because of China's increasing demand for food and energy (Carvalho 2019, 10; Casanova, Xia and Ferreira 2016, 215; Weller 2017). This trend is not helped by the fact that China's commodity imports from LACs is concentrated in a few products: copper, oil, iron ore, soybeans and wood (Tussie 2011, 339). There is a fair argument to be made that this concentration can exacerbate to LAC commodity dependence.

It is argued that this is a mercantilist strategic policy by China "of promoting downstream value-added activities in China and importing raw materials in unprocessed form (Jenkins

2019, 240). One example of this trend is China's imports of Argentine unprocessed soybeans. In his panel data analysis of 32 Latin American and Caribbean countries in the time period 2002-2015, Jenkins finds that the share of primary products has increased as a part of China's imports from Latin America. In fact, oil, minerals, and agricultural products have represented 85% of China's imports from the region over the last years (2019, 218; 2019, 247). Therefore, one can be forgiven for arguing that China is partaking in a 'recommodification' of the LAC export structure (Jenkins 2019, 225). Meanwhile, US companies deal predominantly in manufacture and services in the region. And as LACs' crude exports are less important for China than for Latin America (composing 9% of China's crude imports in 2014), China commands overweighing bargaining power over its LAC trading partners (e.g. Venezuela, Colombia) (2016, 217; Jenkins 2019, 227).

In his study of Sino-Latin American economic relations of 2003-2009, Jenkins (2012, 1352) finds that this relationship remains asymmetrical (especially in bilateral trade) and has 'centre-peripheral characteristics' (to borrow Dependency theory terminology). This notion is echoed by Didier and Koenig, who claim that China is copying the Western model to exploit LACs (2018, 199). Employing the HHI (Herfindahl-Hirschman Index) for export concentration, he predicts that there is no sign of diversification of exports from LACs to China. In fact, quite the opposite trend seems more likely (2012, 1351).

China does admittedly rely on certain commodities from the continent; most notably  $\frac{1}{4}$  of its iron ore imports and more than 50% of its copper ore and soybean imports are from Latin America (Jenkins 2019, 227). Whether bargaining power was a goal or not for China when trading with LACs is uncertain. They may just as well have had commercial interests utilizing their comparative advantage (a concept of which I will get more into in Section four) (2019, 237-238). And the Sino-Latin American trade pattern surely demonstrate their comparative advantage; while Latin America is a comparatively resource-abundant territory, with lots of agricultural terrain considering its population size, China is labour-rich and in short supply of resources. All the same, while China imports a lot of food from LACs, most of its food is produced domestically (2019, 237-238).

### **2.2.3 LAC export dependency on China?**

In their 2013 study, Ferchen, García-Herrero and Nigrinis have created an export dependency index for Brazil, Chile, Peru and Argentina with regard to four commodities: iron ore, soy,

copper and ores of non-ferrous metals. Their findings indicate that exports of all the four commodities to China has increased from 2002 until 2010. Further, they find that when it comes to these four commodities, general dependency is higher than other commodities (e.g. coal, palm oil). In addition, in all commodities except iron ore, the LACs are more dependent on Chinese demand than other exporters (2013, 9). Argentina provides the most extreme example, exporting a substantial 83% of its soy exports to China. This is especially striking given that Argentinian exports represent less than 13% of world supply. Argentina's weak soybean market power was demonstrated in 2009, when China stopped all imports of Argentinian soy in a trade disagreement. This revealed China's great bargaining power over a LAC.

To build on this argument, Casanova, Xia and Ferreira (2015, 7) found that the LACs which increased their export dependency the most from 2008-2014 were countries that had historically been most commercially and politically connected with the USA. But despite this development, Ferchen, García-Herrero and Nigrinis find that, while reliant on China for trade, LACs GDP growth rates are much less dependent on China than one might think based on the trade figures. For instance, exports to China constitute under 2% of GDP in Brazil and Argentina. This indicates that trade represents a fraction of their economies (2013, 10). This is the case for the majority of large LACs, excluding Chile (where exports represent 33% of GDP). Indeed, "even among South America's commodity-rich exporters to China, overall GDP growth is less directly dependent on China than many might believe" (2013, 11). Lastly, Ferchen, García-Herrero and Nigrinis find that as they are reducing the role of commodity exports as part of GDP, all four LACs included in the analysis are mitigating their economic reliance on commodity exports (2013, 12). The authors also raise the question: if LACs are less reliant on commodity exports to China than what is believed by most researchers, isn't the perception of China as the great 'saviour' of Latin America after the global 2007-2008 recession greatly exaggerated?

#### **2.2.4 6 countries, 80% commodities**

Employing the same export dependency index for the time period 2008-2014, Casanova, Xia and Ferreira (2015, 6) find that export dependency on China has increased in all Latin American countries and sectors (excluding Argentina). The countries with the highest dependency scores were Costa Rica, Colombia, Uruguay, Venezuela, Brazil, Panama, Peru, Chile, Guyana, and Argentina. Out of these countries, Brazil, Argentina, Chile, Peru,

Colombia and Venezuela were the largest exporters to China. These countries had high degrees of dependency focused around four commodities: soy through soybeans and soybean oil, crude oil, copper in the shape of copper ore, copper cathodes and unrefined copper, and iron ore. These primary products represented 80% of total Latin American exports to China (2015, 2). Gallagher and Porzecanski (2011, 461-462) also find that in the period 2000-2006, commodities amounted to 74% of all LAC exports to China. Some fear this perceived dependency on commodities can lead to a “de-industrialization” (Ferchen, Garcia-Herrero and Nigrinis 2013).

Jenkins adds that while petroleum is an important export to China, petroleum exports to China represents a small portion of total Latin American petroleum exports. Mineral exports, on the other hand, represent a much greater part of exports to China. Chile and Peru exports the main bulk of their total copper export to China, while Brazil exports most of the iron ore to the country (Jenkins 2019, 255). Further, China has had an important influence on Latin American soybean export, particularly in Argentina (75%) and Brazil (more than 80%). In fact, the expansion of soybean production in both countries is to a great extent due to Chinese demands. Nevertheless, even though Sino-Latin American trade is restricted to a few LACs, the region as a whole is affected by the indirect effects of these relations. These effects differ depending on which products each country specializes in. One measure of these effects is the terms of trade. In the time period 2002-2011, fuel-exporting countries (e.g. Bolivia, Colombia, Ecuador, Venezuela) and countries with diversified exports (e.g. Argentina, Brazil) experienced an increase in their terms of trade. Predominantly agriculture-exporting countries hardly noticed a change, while chiefly manufacture-exporting countries experienced a reduction of their terms of trade (e.g. Costa Rica, the Dominican Republic, El Salvador) (Jenkins 2019, 256). This latter finding would contradict the argument in favour of diversifying economies.

In short: advantage for the South American economies, disadvantage for the Central American (and Uruguayan) economies. This observation indicates that the effect of trade with China differs between Latin American economies. Of course, China is far from the only influence on LAC terms of trade, but there does seem to be a trend in this time period: countries which have exported commodities most in demand from China have benefited, while countries which have exported ‘less essential’ products like tropical agricultural products and manufactured goods have suffered. All this considered, China-LAC trade is still

limited, not markedly diversified, and the commodities boom has benefited only some LAC countries. In fact, Gallagher and Porzecanski argue that economic relations with China have been positive only for 6 LAC countries, i.e. Argentina, Brazil, Chile, Colombia, Mexico, and Peru. And 10 sectors in these six countries “accounted for 74% of all LAC exports to China and 91% of all commodity exports to China”. The main LAC exports to China was natural resources, including base metals, copper, iron ore, soy, pulp and paper (2011, 462; 2011, 464; 2011, 466-467).

For these 6 LAC “winning” countries, Chinese demand led to an increase in the prices for their exports. However, “Most Latin American countries have a trade deficit with China, which could be difficult to reverse given that the continent exports primarily commodities to China while importing primarily manufactured goods” (2015, 15). This is as I have mentioned due to the lower value-added prices of commodities in comparison to manufactures. They also bring up the fact that China’s economy has slowed down, and this might have severe consequences for Latin American economies, including declining terms of trade due to falling commodity prices. They therefore argue that LACs need to diversify their exports base to leverage their strategic geographic positions in the Western Hemisphere à la Mexico. They also promote trade integration within Latin America and the Caribbean and China. Still, Chile proves to be an interesting case, having managed to benefit from increasing terms of trade in the period 2002-2011, while not experiencing a substantial appreciation of its exchange rate (2019, 257). Thus, China’s influence on commodity exports does not necessitate any negative effects.

### **2.2.5 Deindustrialization**

Gallagher and Porzecanski find indications that Chinese demand is in fact prompting the deindustrialization in Latin America by increasing LAC export dependency on China. Jenkins agrees, arguing that that increased commodity exports to China have contributed to deindustrialization in the region, since capital and labour have relocated from the manufacturing sector (2019, 258). Chinese manufacturing imports to Latin America also threaten manufacturing exports in the region (2011, 461; 2011, 481). Jenkins adds that Chinese manufacturing imports threaten Latin American manufacturing exporters both in their domestic markets and their competitiveness in third markets (2019, 260). Admittedly, the proportion of manufacturing in Latin American countries have been in decline since the 1980s, when LACs started embracing the Washington Consensus (2019, 261; 2019, 272). But

the wave of Chinese imports into internal LAC markets and Chinese competitive manufactures in international markets do put a considerable additional strain on the LAC manufacturing sectors (e.g. Mexico, Brazil, and the Dominican Republic) (2019, 265).

### **2.2.6 Comparisons with effects of China in Africa**

Jenkins reaches the same conclusion when comparing the results of Chinese economic relations with SSASs (Sub-Saharan African States) and LACs. He finds that Latin American manufacturing sectors were in the process of being weakened long before they started trading with China (2019, 261; 2019, 272). Due to this development, Latin American countries have struggled to rival low-salary countries in labour-intensive low-technology industries. Further, they have been unable to contend with developed countries in high-technology sectors due to their limited technological competencies (Jenkins 2019, 268).

In the effort to compete internationally, Chinese low-technology imports have come to replace domestic production in many LACs. When compared with SSACs, however, LACs are significantly less economically dependent on China (Jenkins 2019, 330). Furthermore, the media often promotes the idea that China supports African autocracies and challenges US hegemony in Latin America. Jenkins finds the evidence scarcely credible, however (2019, 334). He demonstrates this by referring to the countries that have been most financially dependent on China, which have not been particularly influenced by Chinese policies. However, as a trading partner, China provides LACs with an alternative to the influence of Western countries and institutions. This has given countries like Brazil and Venezuela the opportunity to introduce policies like economic redistribution to mitigate poverty. But it is important to note that their individual geopolitical environments, their place in the global economy, and the nature of their political and institutional structures affect how China has influenced the countries in Latin America (2019, 334-336).

### **2.2.7 ‘The Friendly Panda’: A Beneficial Trade Relationship**

Surely, Chinese imports do come with benefits, mainly cheaper products for the consumers, potential backwards and forward linkages, technology transfer, and cheap input goods from China can reduce domestic production costs and thereby increase profits for local producers. In addition, some argue that LAC commodity exports leads to an appreciation of these countries’ exchange rates. However, this appreciation may not necessarily be because of



commodity exports, but because of incoming capital from foreign investors due to the continent's enhanced economic situation (2012, 395). Further, there is limited proof of linkages being established, as Chinese firms tend to import parts and components. Castañeda also argues that the structural fragility of the industrialization undertaking in Latin America and the unstable international commodity prices have put the region in a vulnerable position with regards to the global markets. Because, although the commodity exports profits from the first half of the 2000s helped many Latin American countries through the financial crisis of 2008-09, what followed was a steady commodity price decline and a stagnation of the Chinese economy (2017, 23; 2019, 264; 2019, 268).

The LACs' response to the volatility of global markets may suggest a return of economic dependency of global markets in Latin America; by narrowing production to commodity exports and reducing domestic industrialization. In other words, Latin America could once more enter a peripheral role in the world economy. And Sino-Latin American relations may indicate this form of development; being increasingly dependent on Chinese trade, FDI, development loans, and their role in LAC foreign policy support the new LAC dependency. This dependency hinges mostly on trade relations, however. Admittedly, this trend is ambiguous at best (2017, 23). And it is important to note that some LACs have actually strengthened their status in the global markets thanks to economic relations with China, such as Brazil and Chile.

### **2.2.8 A relation of dependency?**

Castañeda (2017, 3) argues that the growing trade relationship between China and Latin America is not one of a dependency. Rather, he argues they have a market-driven relationship, with no political strings attached on the part of China, and that both parties benefit or suffer from international price fluctuations. And Sino-Latin American economic relations are still 'sporadic'; even though there is a desire in many LACs for stronger economic connections with the burgeoning superpower, the fact remains that Latin American countries are still much more economically reliant on the USA and Europe.

And Castañeda rejects the major impact of China's stagnating economy, stating that "Some scholars have presented evidence that refutes the notion that the long-term economic sustainability of Latin America is at risk because of the increasing trade dependency on China". He further argues that since embarking on market-oriented reforms in the 1990s, most

LAC countries have diversified their production scopes and transformed their positions in international markets. As a result, LAC trade relations with USA, Europe and their interregional trade affiliations are now more dynamic. Not to mention, LAC governments are also promoting increased trade with emerging economies in Asia and Africa (2017, 2; 2017, 22).

### **2.2.9 Excessively negative coverage of China?**

Harris (2015) disagrees with what he views as the gloomy coverage provided by the media and academic literature of China in Latin America. He claims that many LACs import all kinds of goods from China; primary, intermediate and capital goods which are used for producing a diverse selection of goods, some of which are exported to other nations. He also questions the premise that the asymmetrical trade relationship between China and LACs is due to China leading a ruthless economic policy on Latin American local manufacturers (2015, 165; 2015, 166-167). According to him there is no sufficient evidence to support such allegations. Harris points out that, in contrast to the dismissive media coverage, a Pew poll discovered a positive impression of China among citizens in some of the most sizeable commodity-exporters to China (i.e. Venezuela, Brazil and Chile) (2015, 167).

Harris also questions the issue of China pressuring LACs to commodity dependency or deindustrialization, arguing that they are not coerced into selling commodities to China, as they have sold these same commodities to, among others, Western countries and Japan for a long time (2015, 171). He further adds that China has slowed down its economy, which he admits will most likely have negative effects on LAC economies. However, if China succeeds in its goals of “growing its economy through increasing domestic consumption, the development of green energy, and technological innovation”, LACs will have a wonderful opportunity to export a diverse range of products to China and engage Chinese investments and loans (2015, 182). Further, some argue that China’s role in Latin America is “peaceful and constructive” (compared to Russia at least), and that Beijing might offer an alternative path to development than that of the Western states.

Jenkins also discovers that while US trade is declining in Latin America, EU trade remains stable and Chinese trade is increasing. And it seems clear that China will be ever-more important in the region in the future. But he adds that “China is far from becoming the dominant economic power in the region that the USA was in the past”. And thus, there is no

need to overestimate the Chinese influence in Latin America (2012, 1356). Harris does find that there are cases of Chinese companies being ‘unscrupulous, illegal, exploitative and environmentally damaging’. Carvalho (2019) also reports many allegations of human rights abuses and environmental damages prompted by Chinese companies in Latin America. However, Harris argues that this behaviour is no worse than that of Western and Japanese companies. Still, a report from Boston University found that ”(...) Chinese trade and investments in Latin America has been a major driver of environmental degradation in the region” because they are “much more concentrated in primary commodities” than other countries” (Harris 2015, 167).

Thus, the literature seems to disagree on Chinese intentions and effects on commodity dependence in Latin America. However, as I have mentioned, China’s economic growth has slowed down in recent years, despite Ortiz’s prediction (2012, 188). This has prompted a decrease in its demand for natural resources and therefore a decline in international commodity prices. Banco de España Economic Bulletin have observed the same development (“The impact of China on Latin America: trade and foreign direct investment channels”, read 24.02.22). This can have negative effects on LAC economies. It is not unreasonable, given that the Chinese economic stagnation has already impacted countries around the world, from Venezuela to Pakistan to Zambia (Casanova, Xia and Ferreira 2016, 216; Burnell, Rakner and Randall 2017, 61; 2017, 58). Finally, as China seems to be aiming for the position as a superpower, I will now move on to what the literature says about whether China is seeking to replace the historic hegemon in the region, the USA.

### **2.3 CHINA IN LATIN AMERICA: A RIVAL SUPERPOWER TO THE US?**

As mentioned above, there are those who simply portray China as just another business partner which only seeks economic prosperity and provides an alternative to Western countries and institutions for developing countries. Some go so far as to argue that China is a visionary, promoting a more multipolar and equitable “world order based on South-South cooperation, the declining influence of Northern-dominated institutions and norms, a less ecologically destructive future, and a ‘commonwealth of civilizations truly respectful of cultural differences’” (Stallings 2020, 27-28; Harris 2015, 154). However, there are others who view China as a more malignant actor which seeks to replace US influence in the region and capitalize on the natural and human resources of Africa and Latin America, as well as impose their own authoritarian political system in these countries (Harper 2018; Stallings

2020, 28). Indeed, they speak of an emerging ‘Beijing Consensus’ to replace the Washington Consensus (Harper 2018). What does the literature say about this perspective?

Some believe that China’s presence in Latin America is “part of a broader geopolitical strategy to challenge US hegemony and bring about a multipolar world” (Jenkins 2019, 235). And there are many who claim that Chinese companies only act in the interests of the Chinese government (2019, 241). And if that is the case, one ought to consider whether the firms act with an overall political goal in mind. However, unlike Africa, Latin America has historically been considered “Uncle Sam’s backyard”. That might be the reason that China has been more careful expanding into Latin America in comparison to its ventures in Africa. Nevertheless, for the last 30 years, China has expanded on its involvement with Latin America, and some argue that it is a countermove to US presence in East Asia. Building on these perspectives, some claim that China’s increasing global presence indicates a power shift from the West to the East, more specifically from the US and Europe to the BRICS countries. And thus, this camp views the Chinese presence in Latin America as a sinister one, with severe political and economic implications. One of these implications is economic commodification.

#### **4.6.1. USA on the way out, China on the way in?**

To be fair, USA has historically been the dominating power in Latin America (at least since the last European colonial power Spain was kicked out of the Western hemisphere as a result of the Spanish-American War of 1898). In fact, for almost 200 years, the USA has considered Latin America as its own protectorate, frequently backing military coups, assassinations of heads of state and invasions of sovereign nations to protect US interests (Britannica 2020; Associated Press 2019). And as the LAC economies crashed in the 1980s after a decade-long import substitution industrialization (ISI) strategy, international organizations (including the World Bank and IMF) forced them to liberalize their economies as a condition for international aid. This was known as the Washington Consensus, which had mostly disappointing results in Latin America (Birdsall, De La Torre and Caicedo 2011, 96-97). Further, Harris points out that it is important to mention the ‘proverbial elephant (...) in the room’: “(...) export dependency and a trade imbalance with the USA and Europe have long been the historical pattern of the Latin American and Caribbean region’s trade relations” (2015, 163-165).

It is not for no reason that the saying ‘when the United States sneezes Latin America gets pneumonia’ appeared (Franko 2007, 36-42). However, under the W. Bush administration, the US influence began to decline in the region, a process which continues to this day (O’Keefe 2020, 207; McKinley 2022). And it might look like China is stepping in to fill the vacuum. With this development in mind, it would be very interesting to investigate whether Latin America is experiencing being liberated from one superpower only to be placed under the supremacy, or export dependency, of another one (Burnell, Rakner and Randall 2017, 81-82). Thus, implied in my analysis is an international rivalry between the US and China. And not without reason: as reported by Heywood (2014, 236), China is on the verge of bypassing the USA in becoming the world’s largest economy. China became the world’s biggest exporter in 2009, it side-lined Japan as the second largest economy in 2010, and with the phrase ‘made in China’ glued onto most commodities in the world, it has earned the title as the ‘manufacturing heart of the global economy’.

### **2.3.1 The Rise of China**

To put its growth into context, “By 2010, the Chinese economy was 90 times larger than it had been in 1978” (Heywood 2014, 236). Further, the endurance of the Chinese economy is illustrated by its handling of the 2007-2009 financial crisis. In addition, the USA owes China \$1.1 trillion in debt (Investopedia 2020). But China’s strengths lie not only in its economy; it also is the second biggest in military spending globally, only beat by USA. Notwithstanding its nuclear armament and the world’s largest standing army, China spent \$261 billion on its military in 2019. In contrast, the USA spent \$732 billion (Tian et al. 2020). And while it is true that the USA did spend almost three times as much on its military than China, it is also important to note that while US military spending is overall increasing, it has mainly fluctuated around \$650-750 billion for the last 15 years. This trend can be explained by the military belt-tightening policies under the Obama administration, and the following increase in spending under the Trump administration. Meanwhile, China’s military spending has only increased every year, from about \$46 billion in 2005 to \$216 billion in 2019 (Duffin 2020; World Bank 2020). Admittedly, the USA generally has seen a steadily rising curve in military spending, at least since the 1960s, but it inarguably has a sizeable rival in China, militarily and economically.

### **2.3.2 China's international ambitions**

Also, China wishes to influence other countries, and affect and shape the rules of the international system. No other country except for the United States has this level of military and economic might combined with international ambitions (Economy 2018, 187). Its international significance can be demonstrated by its increasing influence in the WTO, G20, the 2009 Copenhagen climate change conference (establishing its authority in the discussion of climate change), and its' many bilateral and multilateral relations through economic relations. Meanwhile, US and European authorities are undermined by their colonial pasts (for example LAC resentments against US influence). Admittedly, some argue that China does not yet want the responsibility that comes with world domination. Others argue that instead of a hegemonic order, the world is moving towards a multipolar, fragmented and pluralized world order.

In fact, some dispute the classification of countries into developed or developing countries, as an increasing share of manufactures and services are coming from the developing BRICS (i.e. Brazil, Russia, India, China, South Africa) countries. Thus, these countries differ substantially from other developing countries. Some indeed predict that the combined GDP of BRICS countries will soon surpass the pooled GDP of the six biggest contemporary economies (i.e. France, Germany, Great Britain, Italy, Japan and USA). And finally, as stated above, China has the world's largest population, 1.4 billion, which equals 20% of the world's inhabitants. They also, if well-managed, represent a large supply of labour and legitimacy for its representation in international organizations.

Harris again dismisses this "Chinese threat", arguing that 'economic and political elites' in capitalist countries in the West, as well as Brazil and India, to name a few, have conveniently found a cause in China for the decline of manufacturing, instead of acknowledging the domestic structural factors leading to this downturn and the corresponding fall in international exports competitiveness (2015, 178). Further, China does face challenges, including an aging population, decreasing international competitiveness, corruption, environmental damages, limited natural resources, the prospects for popular unrest and the decreasing sustainability of one-party rule in the face of economic liberalization (Burnell, Rakner and Randall 2017, 62; 2017, 81; Morris 2011, 587; Heywood 2014, 237-240).

## **2.4 MIXED FINDINGS**

When it comes to the effects of commodity dependence on economic development, the research-based literature on the subject seems divided: a high commodity exports share seems to have a negative effect on, not only economic development, but also democratic quality (Wantchekon 1999). Further, natural resources tend to have a negative effect on economic development – but mostly when strong regulatory institutions are absent. Therefore, the relationship between commodity dependence and economic development is contingent on a set of factors (mostly the level of commodity exports share and the quality of institutions). Further, there seems to be an academic disagreement, between both qualitative and quantitative studies, on Chinese intentions and effects on Latin American countries. Some find a clear rise in dependency, while others argue that while that may be the case, trade does not represent a large part of LAC economies. This argument indicates that commodity dependence is not significant, as commodity trade does not constitute a large part of LAC economies.

Still others indicate a rise in commodity dependence, but argue that the effects are individual. Furthermore, on the subject of China as a potential rival to US dominance in Latin America, the literature is equally divided. While some argue that China is just involved in Latin America for mutual commercial interests, others imply a more political, ambitious and sinister intention to replace the USA as a superpower, not necessarily just in Latin America, but on a global scale. Evidently, these discussions are clearly in need of further research. This is the purpose of my study: to aid the clarification of these controversial discussions. Specifically, I seek to answer the following questions: 1) does China affect Latin American commodity dependence? And 2) Do my trade statistics indicate a shift in influence in Latin America from USA to China? I will now move on to my theoretical section, before I move on my methodical choices.

## **3 THEORY**

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And thus, I have presented the literature review, in which some key discussions reveal themselves. Two of them will be empirically analyzed in this thesis. The first one is: which effect does trade with China have on Latin American commodity dependence? The second one is whether there are indications as to whether China seems to be replacing US influence on the continent. But before moving on to the analysis, it is important for a researcher to have one or more theories to guide the analysis. For instance, I will build my hypotheses with basis

in the perspectives of the Dependency theory, while the Neoclassical economics will serve as a counter-narrative. That is not to say that the relationship between theory and empirical research is not reciprocal: by testing my hypotheses in my empirical analyses with basis in one or more theories, the results of these analysis can both weaken and improve and build upon the theories (Omenka et al. 2017, 130; 2017, 134).

Theories can also serve as a tool to better understand and interpret complex phenomena, be they social, economic, cultural et cetera. And with this in mind, I will in this section present my theoretical arguments and testable hypotheses. For the sake of a proper theoretical discussion, I will view commodity dependence through the lens of the two opposing theories, namely Dependency theory and Neoclassical Economics (Ocampo 2017, 52). I will present these theories now, starting with Dependency Theory.

### **3.1 TWO OPPOSING SCHOOLS OF THOUGHT: DEPENDENCY THEORY VS NEOCLASSICAL ECONOMICS**

#### **3.1.1 Dependency Theory**

The dependency theorists argue that commodity dependence has a negative impact on development, as international commodity prices are inherently unstable and tend to be less profitable than manufactures and high-tech goods. Which we have covered above. According to them, the very structure of the international economic system is a dual system which consists of developed countries in the centre and underdeveloped countries in the periphery, of which the first suppress the latter to maintain its dominant status. They argue that although formal colonialism has been eradicated, the power of the global economy is held by former colonizing states, more specifically the G7 (and Russia).

The G7 is so powerful, economically and militarily, that they can decide the terms upon which other countries interact with them economically. Another example of developed countries' domination of international relations is the predominance of voting proportions by the largest economies in the IMF and the World Bank, and through other "international special-interest power groups, including multinational corporations, national bilateral-aid agencies, and multilateral assistance organizations" (Burnell, Rakner and Randall 2017, 63; Todaro and Smith 2009, 123). Just consider that GATT (WTOs predecessor) discriminated against developing countries, granting developed countries exclusive rights such as tariff and



quantitative reductions. It is no wonder that GATT was by developing countries considered a “rich men’s club” (Tussie 2011, 334). Thus, Dependency theory argues that there is an asymmetrical power relationship between developed and developing countries.

### ***3.1.1.1 Unequal Exchange***

The literature on Dependency theory has historically revolved around the prosperous industrialized Western countries maintaining their status and development by exploiting the rest of the world, including China and Latin America (Ardanaz, Scartascini and Tommasi 2011, 52). The way this asymmetrical relationship worked, was that the developing countries supplied raw materials (e.g. cotton) to the developed countries, which used the raw materials to produce higher value-added manufactured goods (e.g. textiles) to sell for a higher price back to the developing countries, stripping developing countries of the necessary capital to develop, perpetuating an unequal relationship which leads to declining terms of trade for developing countries. This view is the essence of the *Singer-Prebisch theory*, which implies external constraint to development for developing countries. In a similar vein, *the theory of unequal exchange*, developed by Arghiri Emmanuel, argues that in a situation of perfect competition, trade between developed and developing countries consist of a relocation of profits from the latter to the former. This is because developing countries often export products from lower-wage sectors, and therefore their products are cheaper than the products from the developed countries.

In addition, developed countries tend to have trade unions which protect and fight for higher wages. The result is that developed countries gain higher profits (and therefore higher terms of trade). It is argued that this unequal relationship has roots in colonialism, where “the economies of many former colonies [are] dominated by primary commodities”. And it is true that China is reaping massive rewards for its internationalized development strategy, by financing infrastructure projects overseas for the “production of goods and the extraction of resources that are then shipped back to spur Chinese development” (Wise 2020). This trend could be reflected by the North-South export structures, where the North exports mainly manufactures and high-tech goods, while the South exports primarily basic commodities (Oatley 2019, 124; 2009, 123; Burnell, Rakner and Randall 2017, 59-60; 2017, 64; Encyclopedia 2019; Ocampo 2017; Wang 2008).

### ***3.1.1.2 Free trade = deindustrialization, retrogression, economic primitivization***

However, besides the theory of unequal exchange, it is important to note that the dependency theory is not one unified theory. Rather it consists of several individual theorists, such as Raúl Prebisch and André Gündar Frank. Prebisch, for example, argues that the central Northern countries experienced economic growth from production. These profits were transformed into increasing salaries and stable prices because of the pricing power of business and unions. Meanwhile, the Southern, peripheral countries, witnessed persistent low wages and slow productivity growth. Further, agriculture and mining functioned as a brake on the economy. This unequal distribution of economic gains was due primarily to declining terms of trade, as developing countries would have to export more and more to gain the profits to import the same volumes as before (Franko 2007, 57). Frank argues that “underdeveloped countries were not developed countries in the making; rather, industrial countries had caused underdevelopment in other nations in the process of economic expansion” (2007, 57-58).

Reinert echoes this view: while free trade proves beneficial for established industrialized countries, it proves devastating for developing countries, which have not necessarily built strong manufacturing or service sectors, leading to deindustrialization, ‘retrogression’ and ‘economic primitivization’ (e.g. NAFTA’s effect on Mexico, post-1989 Mongolia, late-1970s Peru). In addition, the wealthiest countries have the highest tariff barriers in the world and provide subsidies for agriculture which makes it challenging for developing countries to compete (2008, 166; 2008, 171-179; Burnell, Rakner and Randall 2017, 65). In other words, one could argue that developed countries and their imposition of global free trade in the international arena are ‘kicking away the ladder’ for developing countries to develop. The circumstances might change, but the system persists.

There are those who argue that globalization is the new ‘colonization’; according to the Vanek-Reinert effect (based on the Rybczynski Theorem of standard trade theory), free trade between a comparatively advanced and an underdeveloped country will lead to the breakdown of the most advanced and knowledge-intensive industry in the underdeveloped country (e.g. Italy after unification in 1860s, post-1989 Mongolia and Czech and Brazilian computer industries) (2008, 181). In other words, “(...) a colony, now as five centuries ago, is fundamentally a country that is only allowed to produce raw materials”. And “many Third World countries are now in danger of losing the development gains they achieved in the post-Second World War era” (Reinert 2008, 187). In stark contrast to the Neoclassical Economics

(as I shall elaborate upon below), Dependency theorists argue that the market alone is incapable to produce growth. Instead, according to them, the state can play a key role in promoting growth by producing goods and services, maintaining infrastructure (e.g. railways, roads), and public services (e.g. education, health). And last, but not least, the state can combat the strong influence of the international and domestic elites (Franko 2007, 24).

### ***3.1.1.3 From one hegemon to another?***

But it is very hard for developing countries to reindustrialize, as more and more knowledge-intensive industries are shielded by patents and the increasing importance of service industries (Reinert 2008, 180-181). To make matters worse, this process leads to what Gunnar Myrdal termed ‘perverse backwashes’: skilled labour and capital from developing countries migrate to developed countries (2008, 191). Given that developing countries are left to depend on commodity exports to the international market, one could claim that globalization strengthens the centre-periphery system claimed by the Dependency theory. The only way for developing countries to alleviate this unfair position is through “increasing import substitution, industrialization and a more diversified industrial sector” (2008, 187; 2009, 124; Heywood 2014, 104). With the rise of China as an international player, it is tempting to beg the question: Is Latin America now being liberated from one hegemon to fall under the influence of another?

Noted, contemporary global trade is yet more complicated, involving ‘vertical specialization’ in which countries take part in specific areas of production in ‘global value chains’ (Rochon and Rossi 2016, 278). These global value chains trade in agricultures, manufactures and services. They represent one of the main organizational trademarks of world trade, and are becoming increasingly complex (Coe, Kelly and Yeung 2007, 97-101). However, this contemporary system is also problematic for developing countries: by ‘chopping up’ global value chains, developed countries concentrate on capital- and innovation-intensive production which offers increasing returns, while developing countries lose their advanced sectors and are relegated to labour-intensive production of raw materials, offering limited scale and diminishing returns.

Another problematic aspect of globalization (and its deindustrialization in developing countries) is its effect on terms of trade. Deindustrialization and declining terms of trade appear to be linked: free trade leads to the deterioration of trade union leverage and the

bereavement of the industrial workforce, which in turn prompts falling labour earnings. International commodity market pressures push down the relative price of commodities and of national labour earnings. As there no longer exists an alternative sector to attract workers, the commodity production sector increases. This precedes diminishing returns and downsizes the marginal productivity of labour. In other words, free trade leads to the deterioration of terms of trade and primitivization of production. Thus, under this system, the economic inequality between developed and developing countries widen (Reinert 2008, 181-182).

### ***The commodity lottery***

Another interesting concept is that of the ‘commodity lottery’, which states that the economic prosperity of the respective country depends on which commodity it produces. While some commodities encourage forward and backward linkages, such as those made through capital-based production (e.g. nitrates), others, such as those made through labour-based production, do not (e.g. bananas). To clarify, backward linkages happen when producing one product boosts demand in industries which provide the parts for that product, while forward linkages are when the increased demand for these cheap parts for a product stimulates investment in further production stages (Oatley 2019, 127; Clunies-Ross, Forsyth, and Huq 2009, 115; Bulmer-Thomas 2003, 83).

But which commodities each country specialize in depends on their geological, geographical, and technological capacities; Chile, for example, cannot produce coffee or oil, but it can produce wheat and copper. Their prospects for economic growth vary on the commodities they have available. This is the principle of the ‘commodity lottery’. In other words, some commodity production boosts economic diversification. This might explain why some export-led countries (e.g. Norway, Australia, the Asian Tigers, and more recently, China) are more successful and robust than others (e.g. Chile, Haiti). However, looking at Japan and Switzerland, one might argue that “the best draw in the commodity lottery was to have no commodity”, as previously argued by Pineda and Rodriguez in Section three (2008, 186; 2011, 414).

#### ***3.1.1.4 Critique of Dependency Theory***

Carol Wise disputes the relevance of Dependency theory in the case of the current Sino-Latin American trade relationship, as it ignores that the LACs are “considerably more industrialized and macroeconomically stable than in days of old”, indicating that Dependency theory cannot

fully explain the varied performance of these emerging economies in the international political economy. Instead, according to her, the China-LAC relationship signifies a resource curse. Thus, what she implies is that the fault is with the domestic governments' macroeconomic policies more than with an unfair international system described by the Dependency theory. And it is true that we have in many LACs seen a "(...) dependence on commodity exports at the expense of the industrial sector, job creation, and sound macroeconomic policy making". And even though Dependency theory has been highly influential, it has been criticized on some further points. First of all, it has been criticized for being highly generalizing and deterministic in its economic understanding. Second, it has been known for being unspecific and fuzzy; how is it to be defined? Is it a theory or an approach? Which methodology should one use with respect to the dependency theory?

Third, it emphasises international factors as determinants of underdevelopment, and therefore tends to neglect domestic factors such as politics and institutions. Fourth, and relatedly, it undervalues class conflict in favour of regional, national and international factors, and therefore is blamed for practising "'Neo-Marxism' without Marx" (Namkoong 1999, 143). A fifth critique is that, in the attempt to answer the underdevelopment of Latin America, dependency theory has failed at providing credible evidence of why some LACs have higher economic development than others, and neither does it explain how a country (e.g. Argentina) can in a short matter of time move from economic success to failure (Bulmer-Thomas 2003, 13). Sixth, it has been criticized for not being able to explain the development (or lack thereof) of countries in East Asia. Dependency theory states that "(...) the periphery is unable – economically as well as politically – to develop due to the asymmetric dependency" on the West (Møller and Skaaning 2013, 98). But one of the most significant examples of economic success in Asia is the developing country China, which has become not only as rich as most developed countries, but in fact is rivalling the greatest world economic power in wealth. Seventh, several international events in the 1980s undermined the ideology of the Dependency theory: 1) international loans from the World Bank and the IMF to states eased foreign exchange constraints and strengthened the position of governments in relation to MNCs (multinational corporations), considered the main perpetrator of dependency; 2) the rise of an intellectual milieu promoting free trade and smaller governments. These first two events grew to define the Washington Consensus. And 3): the fall of the Soviet Union which weakened the Marxist movements; 4) not to mention, as a consequence of its fall, the Soviet

government stopped financing socialist governments around the world, weakening non-capitalist regimes globally.

And, lastly, while it is tempting to put all the blame on China, it is important to mention that LAC governments can install policies which downplay the negative effects of natural resources, including levying of taxes to share the revenues, protectionist measures for the manufacturing sector, and put in place industrial policies which incentivizes local processing and supply in extractive sectors. In any case, regardless of its influence in the 1970s and 1980s, dependency theory has faced considerable criticism, and is rarely referred to today (Namkoong 1999, 141-144; Burnell, Rakner and Randall 2017, 18; Stallings 2020, 7-10; Jenkins 2019, 258). But dependency theorists have never disappeared, especially in Latin America, where governments have often been exposed to external economic shocks. To test the Dependency theory, I will add as CVs *capital imports from China* and *international commodity prices* and *GDP growth*. In addition, I will add the *rule of law CV* to test the Resource Curse and the hypothesis about strong institutions elaborated on in Section three.

### **3.1.2 Neoclassical Economics: Comparative Advantage and the Solow Model**

The neoclassical school would disagree with the Dependency theory. First of all, they argue that globalization, with its free trade is positive for both developed and developing countries; they promote the policy of *laissez-faire*, in which an unregulated market, operating freely from government intervention, is self-equilibrating in the long run (Heywood 2014, 90). Second, they claim that liberalized markets integrated into the world economy would be a strategic move for developing countries. They support their claim based on Ricardo's comparative advantage theory (CAT), which goes as follows. A country has limited resources, and therefore should allocate them to produce goods based on the nature of these finite resources. If it has most labour resources, it should prioritize labour-intensive production (e.g. primary products, manufacture), while importing capital-intensive products. If it has the most capital resources, it should prioritize capital-intensive production (high-tech, manufacture), and import labour-intensive goods. This is because, as the *Heckscher-Ohlin model* (basically a more flexible version of the CAT) states, "A country's abundant factor will be cheaper to employ than its scarce factor".

The abundance of one resource will therefore grant a country an advantage in the production costs of a good in the global market. We can therefore see that, since developing countries

often are rich in labour, they tend to emphasize labour-intensive (e.g. agriculture, textiles) production in the global market, while the developed countries are rich in capital, and therefore specialize in capital-intensive (e.g. automobiles, telecommunications) production. There are of course exceptions, like the four Asian Tigers, which, although labour-rich, developed into manufacture and high-tech producers and exporters (hence the ‘Asian miracle’). Thus, today they are considered some of the wealthiest countries in the world (Gallardo 2005; Oatley 2019, 47-53; Rochon and Rossi 2016, 261-26; Clunies-Ross, Forsyth and Huq 2009, 219; 2019, 146-148).

Thus, this theory argues that since Latin America by and large is abundant in labour and natural resources (over capital), it should stick to labour-intensive production of natural resources for exporting to the world market, while importing capital-intensive products (Baker 2003, 430). This seems to properly define the LAC-China trade relations. In comparison to China, Latin America has an abundance of natural resources, counting 45 % of all the worlds’ copper stock, 44.3 % of the worlds’ crude oil and 17.8 % of the world’s gold supply. Further, they have about half of the worlds’ renewable water supply, one-fourth of cultivable land and the biggest forest stock in the world (Casanova, Xia and Ferreira 2016, 215). Latin America champions China in many ways: “(...) it has seven times more cubic meter of fresh water per capita, more than three times square kilometre of land per capita and eight times the square kilometre of forests per capita than China”. On the other hand, China has a bigger and cheaper labour force with its four times larger population than the whole region of Latin America. Thus, it makes sense according to the Comparative Advantage theory that Latin America specializes in exporting primary products to China, which in turn uses these commodities to produce and export more advanced manufactured and high-tech products with its cheap labour force.

According to neoclassical economists, free trade through the CAT will lead to ‘factor-price equalization’: that wages to the factor of production (i.e. capital and labour) in developed and developing countries will even out (Reinert 2008, 28; 2008, 47). And thus, developing countries will emerge as developed (or ‘modern’) countries, as is the cornerstone of the Modernization theory (Heywood 2014, 363). And indeed, there is evidence indicating that developing countries are the true benefactors of open trade, leading to faster growth and decreasing poverty (Perkins et al 2013, 666). Further, the Solow model suggests that all countries with identical levels of savings, productivity growth and labour force growth will

over time achieve the same levels of income (Todaro and Smith 2009, 147). Writing on the eve of the Financial Crisis of 2008-09, Erik S. Reinert argued that the CAT is “the bedrock of today’s international economic order”. The neoclassical agenda has been established through the ‘Washington Consensus’ (although many now speak of a rising ‘Beijing Consensus’), which dominates world policies on international development. In fact, “The neo-classical paradigm and its successors have acquired a monopoly on what is considered acceptable economic policy” (2008, 18; 2008, 170).

### ***3.1.2.1 Criticism of Neoclassical Economics***

However, neoclassical economics and the CAT faces some criticism. First of all, the collapse of the Soviet Union signaled the triumph of capitalism and free trade, and world free trade was supposed to even out the economic differences between rich and poor countries (2008, xviii). However, as pointed out by Reinert above, this is just not true. In fact, he argues that the free reign of neoclassical policies after the end of the Cold War has been not only contradictory, but “nothing less than catastrophic for many developing economies, yet the same gurus and the same theories are still in power”. Rather, this development indicates a “factor-price polarization” between developed and developing countries. Examples are Somalia, Afghanistan and Iraq (2008, 198-199; 2008, 244). Secondly, neoclassical economics assumes that, when left to itself, the market is a self-sustaining entity. However, the market has been proven to have many flaws when left to itself. Some examples are governments’ frequent bailouts of banks due to failing markets (leading to ‘moral hazard’), the market’s lacking mechanism for creating public goods (not accounting for the gap between individual and collective well-being), the alleged homo economicus not considering the external effects of their actions (e.g. free-rider problem, herd effects), thus not having “perfect information” (de Grauwe 2017, 28-36).

A case in point is the consequences of trade liberalization in Latin America in the 1980s and 1990s: while it led to increased productivity and economic growth, this effect was humble, and it did not affect employment composition. This latter point contradicts the CAT, of which the assumption was that resources would “ (...) move massively toward activities that were potentially more efficient and more intensive in the use of the most abundant resources” (Lora 2011, 388). In the case of Latin American countries, which mostly were labour- and natural resources-abundant (with some exceptions), the assumption would be that the economic



resources would flow towards the primary sectors. But this was alas not the case. Trade liberalization also led to a decline in wages for low-skilled workers, which goes against the neoclassical assumption of wages adapting to a worker's marginal productivity. Rather it increased the economic inequality between skilled and unskilled labour. At the same time, de Grauwe claims that "No other system has succeeded so well in creating material prosperity [than the market system]" (2017, 13-37; 2017, 54).

Further, and on a related note, as pointed out by heterodox economists, the theory unreasonably assumes balanced trade and full employment, which is not realistic, and even if it was, international trade creates winners and losers (meaning positive and negative terms of trade), and critics argue that this increases the inequality among countries. Fourth, the Asian tigers are often heralded by neoclassical economists as proof that the market works. Yet, it is disputed how much the success of the Tigers was due to neoclassical policies (at least two of them, South Korea and Taiwan) (Paldam 2003, 475). Fifth, while neoliberal economists claim that profits will even out through factor-price equalization, changes in terms of trade seem to move profits unequally among nations. Therefore, LACs which are commodity-based economies may benefit from an increase in commodity prices on the world market, but it can also lead to a 'Dutch disease', even deindustrialization, as seen recently in Latin America.

Reinert goes so far as to claim that "no country has ever become rich by exporting foodstuffs without also having an industrial sector" (2008, 166). This last comment disagrees fundamentally with the theory of comparative advantage. Sixth, CAT is criticized for being too 'static', in that it offers a solution for a country based on its technology and resources, but it does not encourage countries to develop their technologies in the long run, which may be a vital step for improving the living standards of its citizens (Rochon and Rossi 2016, 259-260; 2016, 271; Burnell, Rakner and Randall 2017, 64).

Therefore, Reinert argues that the CAT "has created an economic theory that makes it possible for a nation to specialize in being poor". He cleverly adds that "Few economists tell their children that they might as well start a career washing dishes, where they might have a 'comparative advantage', rather than seek a career as a lawyer or medical doctor". Scathingly, he also writes that putting neoclassical economists from the IMF and World Bank in charge of determining the effects of free trade on developing countries is like putting "Attila the Hun in charge of the Reconstruction of Rome", with no regard to the damages done or how it could

have been prevented (2008, 19; 2008, 25; 2008, 179). In addition, the Solow model has been criticized for not fitting as much for developing economies as for developed economies.

And lastly, from a historical perspective, with every era of ‘free trade euphoria’ has followed a hangover phase; after the free trade enthusiasm of the 1760s came the French Revolution; after the 1840s and its proponents of free trade came the revolutionary 1848; after the post-1989 ‘end of history’ and triumph of capitalism and free trade came the 2008-09 financial crisis (2008, 246). For the sake of testing the Neoclassical economics theory and the CAT, I will add as *CVs trade openness* and *GDP growth*. Trade Openness illustrates the effects of being integrated into the global economy. According to the Neoclassical economics, a being integrated into the global economy, developing countries will prosper economically into developed countries (remember the factor-price equalisation). This would imply that trade openness will lead to decreased commodity dependence. Further, GDP growth should also lead to a decrease in commodity dependence, as the country’s profits will be shifted to other sectors than the primary sector, leading to a diversified, richer and more stable economy (consider the Asian Tigers as an example). Now that the implications of trade openness and GDP growth are to developing countries for the Neoclassical economics, let us now move on to explaining the expected causal relationship between my variables.

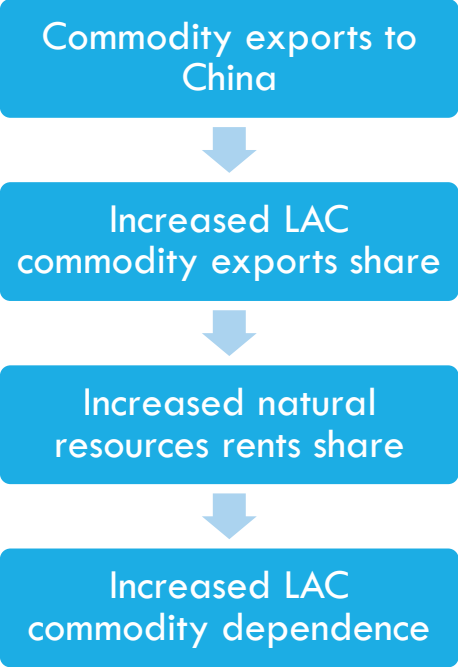
### **3.2 EXPLAINING THE EXPECTED CAUSAL RELATIONSHIP BETWEEN MY VARIABLES**

With basis in the academic literature and theory elaborated upon above, I will now explain the causal relationships between the variables included in my analysis, which are picked based on the tenets of Dependency theory. Neoclassical Economics and the CAT will serve as a counter-narrative to the Dependency theory. Further, with basis in the illustrated causal relationships I elaborate on below, I will present my hypotheses. Included in this section will also be illustrative models. I will start with my dependent variables, before I move on to my independent variables and finally my CVs. As you have already been informed, commodity dependence is generally associated with negative economic development. In my analysis, I will employ two dependent variables to represent commodity dependence. The first one is commodity exports share.

#### **4.2.1. My dependent variable (DV) #1: Commodity exports share**

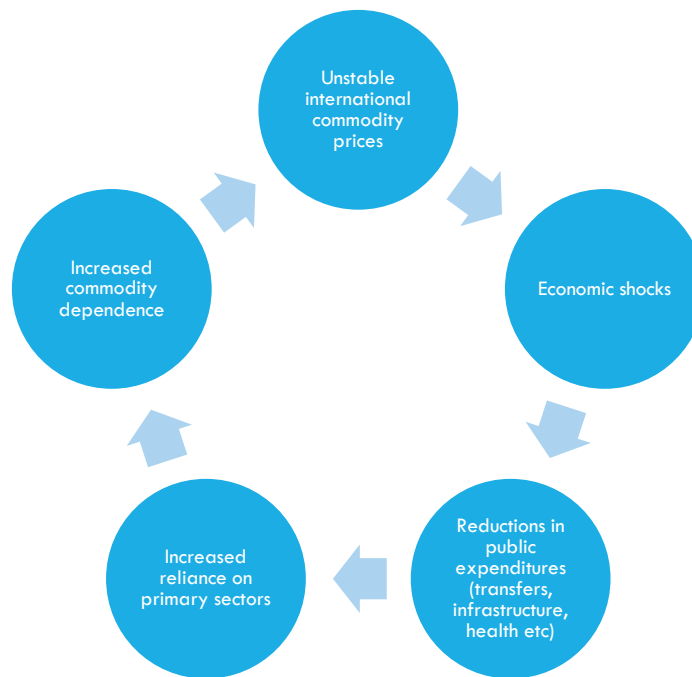
In my sections three and four, I find implications (not without criticism) that the growing trade relationship with China is furthering Latin American commodity dependence.

Commodity dependence is, as explained above, associated with many negative consequences (see Section 2.1). Below I provide a causal diagram of the expected relationship between my IV and my DV.



**Figure 1:** Causal framework of the effects of trade with China on Latin American commodity dependence

With basis in the literature above, increased trade with China seems to increase LAC commodity export share, which again would indicate a rise in natural resources rents share, therefore leading to LAC commodity dependence. This in turn can have significantly negative consequences as mentioned in the literature review above, including volatile economic growth, depletion, deindustrialization, and famine. In fact, as explained in section 2.1, commodity dependence can signify a vicious cycle, as illustrated in Figure 2:



**Figure 2:** Causal Diagram of the vicious cycle of commodity dependence

As you can see, becoming commodity dependent can lead a country into a considerably unfavourable situation which might be hard to escape. Dependency theory argues that commodity dependence is a state imposed on developing countries (‘the periphery’) by developed countries (‘the centre’) by forcing them into commodity exporting countries, while developed countries export higher-quality and higher value-added products (manufactures, high-tech goods). Neoclassical economics fundamentally disagree with this point, arguing that commodity dependence is a natural impermanent state for a labour- and resource-rich country, as it according to them should focus production of that which it has an abundance.

In any case, there are implications in the academic literature that the growing Sino-Latin American trade relationship is furthering LACs into commodity dependence (see Section 2.2). I will test this theory using two dependent variables representing commodity dependence. The first one is *commodity export share of total exports*. My assumption is that the higher the commodity exports share, the more commodity dependent a country is. Borrowing the definition by UNCTAD (2019), I define a country as commodity dependent when commodity export share constitutes 60% or more of a country’s total export basket. Given that I have not yet observed a study testing the same variable for commodity dependence (although there

may be many who do), I am eager to find my results. I will now present my second dependent variable representing commodity dependence: *Total Natural Resources Rents % of GDP*.

#### **4.2.2. My dependent variable (DV) #2: Total Natural Resources Rents (% of GDP)**

This variable is based on the Dutch Disease argument, which states that a country (particularly a developing country) rich in natural resources tends to emphasize its profits to boost these primary sectors, and in the process weaken the manufacturing sectors. This is again claimed by the Dependency theory, as it through the Singer-Prebisch theory and the Vanek-Reinert effect (see section 3.1.1.2) argues that developing countries force developing countries into deindustrialization, again forcing them to be commodity-exporting economies.

This will lead to an over-reliance on natural resources as a source of national economic growth. It should be obvious by now which disadvantages this development can bring with it. In case you forgot, I'll remind you: "Dutch Disease, economic volatility, rent-seeking, and weak institutions, all of which are argued to negatively impact growth" (Pineda and Rodríguez 2011, 411). My assumption is that the more a country's GDP consists of rents from natural resources, the more reliant on the primary sector it is, and therefore the more commodity dependent it is. In a similar vein to Sachs and Warner's natural resource proxies (exports as share of GDP and net resource exports as a share of GDP), my second dependent variable will be *Total natural resources rents (% of GDP)* (Pineda and Rodríguez 2011, 418).

#### **3.2.1 Commodity exports to China**

As you know, Dependency theory argues that developed countries are exacerbating developing countries' commodity dependence, and one way in which they do this is through trade. I expect that the increased primary product demand from China has boosted Latin American 're-commodification', encouraging them to boost their primary product sectors without adequately supporting other industries such as the manufacturing and high-tech sectors. My assumption is therefore that trade with China is advancing LAC commodity dependence. Consequently, I have the following hypothesis:

**H1:** *Higher levels of commodity exports to China lead to greater commodity dependence.*

### 3.2.2 Chinese capital imports

As I have already covered previously, the Dependency theory, backed up by the literature indicates that LACs tend to export commodities and import advanced products. The argument is that by importing advanced products, the manufacturing sector and industry of LACs are replaced by advanced imports from countries like China. With a weakened manufacturing sector, LACs emphasize the commodity sectors, and import more and more manufactured and advanced goods. This development perpetuates an evil cycle of exacerbating commodity dependence. According to the Dependency theory, this is one way for the developed countries (the ‘center’) to hinder the development of developing countries (which in Dependency theory terminology means keeping them in the ‘periphery’). To represent advanced products from China, I will add the variable *capital imports from China*. My hypothesis is thus the following:

**H2:** *Higher levels of capital imports lead to greater commodity dependence.*

### 3.2.3 Commodity exports to USA

As mentioned on the commodity export variable to China, Dependency theory argues that one of the ways developed countries keep developing countries from development is through trade. As USA is considered one of the most powerful developed countries in the world, my assumption is the same as the one for the commodity exports to China variable: trade with USA further exacerbates LAC commodity dependence. Therefore, my hypothesis is as follows:

**H3:** *Higher levels of commodity exports to USA lead to greater commodity dependence.*

### 3.2.4 Trade Openness

According to Dependency theory, another way that developed countries hinder the development of developing countries, is by imposing free trade agreements (FTAs) with countries which have not yet developed adequate industrial sectors. And as a consequence, entering FTAs with developed countries lead to deindustrialization, ‘retrogression’ and ‘economic primitivization’ (see section 3.1.1.2). In other words, Dependency theory would argue that trade openness is detrimental to LACS. Neoclassical economics, on the other hand, argue that this is a necessary circumstance for LACs to prosper in the globalized economy. According to them, trade openness will bring more wealth for a developing country,

furthering a more diversified economy and transforming developing into developed countries. Thus, according to Neoclassical economics, trade openness will lead to a reduction in commodity dependence. However, my assumption is again rooted in Dependency Theory in which I propose the following hypothesis:

**H4:** *Higher levels of trade openness lead to greater commodity dependence.*

### **3.2.5 Rule of Law**

As previously stated, Dependency theory views the intervention of the state as key to develop a country. According to them, the state can support development by providing public services, the production of goods and services, and to work against the dysfunctional markets, as well as the domestic and international elites. I intend to test the role of the state by adding my Rule of Law variable. This variable includes central features to legal and political institutions, including high and low court independence, judicial accountability, executive respect for constitution and public sector corruption exchanges. These are the main elements in what many consider 'good governance'. Thus, I believe this variable is appropriate for capturing the effects of legal and political institutional quality. Thus, my hypothesis H5 is:

**H5:** *Higher degree of rule of law leads to a reduction in commodity dependence.*

### **3.2.6 GDP per capita growth and GDP aggregate growth**

In line with the Dependency theory, I believe that when a commodity-dependent country experiences a rise in international commodity prices, it spends its corresponding profits on boosting its primary sector instead of attempting to diversify its economy. And thus, economic growth leads to exacerbating rather than reducing commodity dependence. Neoclassical economics would not completely disagree: while arguing that developing countries should emphasize their production of the resources of which they have an abundance (Comparative Advantage Theory), they also argue that GDP growth in these countries over time would lead developing countries to more diversified and prosperous countries (factor-price equalization), in effect transforming them into developed countries. My hypothesis will once more base itself in the view of the Dependency theory:

**H6:** *economic growth leads to increased commodity dependence.*

The null hypothesis for all these variables is that there is no correlation. In this chapter I have presented the theories I will utilize as tools when interpreting my regression results. Further, I have presented the hypotheses I intend to test in my analysis. I will now move on to my method chapter, where I will describe and explain my research design and methodical choices. Then, before I run my analysis, I will elaborate on my data.

## **4 METHOD**

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### **4.1. MY MODEL**

To examine my hypothesis, I will implement a three-step, quantitative, statistical panel data, multivariate regression analysis of 22 LACs, from 1990 until 2019. Thus, it will involve country-year units. The panel data analysis provides me with a unique opportunity to do a cross-sectional analysis of countries over a long time period (in my case 30 years). This gives me many benefits. First of all, monitoring the same units over time permits me the control for potential unobserved features (such as heterogeneities and omitted bias) to these entities (Kellstedt and Whitten 2018, 215-216; Kennedy 2003, 302; Wooldridge 2009, 10-11; Urdinez and Cruz 2021, 158).

In addition, the panel data allows us to observe the effects of lagged variables, which is important in cases where diverse factors may come into effect after some time. This is to be expected in my case as I am going to research complex economic phenomena such as trade and the effects of a government's national resource revenue. For this purpose, will therefore lag my dependent variables by one year. Next to being able to capture the effects and dynamics of variables after the passing of time, lagged dependent variables can also remove residual serial correlation. But then again, the disadvantage of lagged variables is that it also might produce biased coefficient estimates in the presence of residual autocorrelations (Keele and Kelly 2006, 186-187; 2006, 201). However, since I am going to control for autocorrelation (see section 4.1.7), this should not be a problem.

The panel data differs from time series cross-sectional (TSCS) analysis in that the unit of interest is the sampled population, and not the individual units. Further, in TSCS the units are fixed, while in panel data analysis the units are sampled (Urdinez and Cruz 2021, 152-153). And not to mention, a panel data has a unique way to obtain dynamic observations from its units which, unlike time series, does not require an extensive time series (2003, 302). The



dataset is unbalanced in that not all the countries have data on all variables for the entire time period. Further, I have ran a Hausman test to assess whether I should run FE or RE model. The Hausman tests exposes whether there is a correlation between the explanatory variables and the standard errors. If there is a correlation between them, this would mean a normal OLS (which assumes no correlation between them) would not function. No correlation supports random effects; if there is correlation, fixed effects are advised (Glen 2017). According to Bell, Fairbrother and Jones (2018, 1062), failing to reject the null hypothesis in the Hausman test does not invalidate the random model, but rather estimates whether there is a difference between the *within* and *between* effects of the model. Be that as it may.

Following the results from the Hausman test, I will run one FE model and one RE model (see Appendix C for Hausman results) (Urdinez and Cruz 2021, 163; 2010,6). There is an argument to be made for random effects which allows for within and between effects (REWB), but I will leave that venture for future research (2018, 1052). Running time and country (two-way) FE model for the DV commodity export share can control for potential omitted variables in the model assessing the *commodity export share*, and the same procedure with random effects in the model testing *total natural resources rents share*. In addition, given that I am only analyzing countries from a specific region, I need to consider the risk of spatial dependence and spatial clustering of the countries in my analysis. To inspect this issue, I check for autocorrelation and heteroscedasticity problems using the Breusch-Pagan test which shows serial correlation in the data (see Appendix C). Observe that both Breusch-Pagan tests reject the null hypothesis, and therefore we can assume that both models suffer from heteroscedasticity. Therefore, to control for possible heteroscedasticity, I will run my FE and RE models using the *Driscoll-Kraay standard errors* (which I will properly define below) clustered by country, as these standard errors allow for generating consistent estimates in the case of autocorrelation, possible heteroscedasticity and spatial and temporal dependence (Hoechle 2007, 282).

My data contains 22 (independent) countries from Latin America and the Caribbean, that is, two-thirds of all Latin American and Caribbean countries. The countries included are Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago and Uruguay (Worldometers, 2). I have excluded the following countries from my analysis due to unsuitable levels of missing values: Antigua and

Barbuda, Cuba, Dominica, the Dominican Republic, Haiti, Grenada, Guyana, Saint Kitts and Nevis, St. Lucia, Saint Vincent and the Grenadines and Venezuela. Given that my analysis involves 660 observations and a 66.6% sample size (22 out of 33 countries) I consider it a large-N analysis (Worldometer 2020).

This brings us to the issue of *validity*, of which there are two primary types: internal and external. *Internal validity* refers to whether my statistical analysis involves causal relationships (relationship between my variables) and units which are representative to the population I intend to analyze. There are some key issues one might face regarding internal validity, among them being *selection bias* and an issue I have mentioned with relation to fixed effects, *omitted variable bias*. When your IV is biased because it is related to a variable in the error term, this is called ‘omitted variable bias’ (Huntington-Klein 2021). As my analysis includes 66.6% of the total population, I believe it is representative of the population I am analyzing, and therefore my choice of units does not suffer from selection bias. My analysis does suffer from some *omitted variable bias*: although I have included most of the variables I consider most relevant to explain the effects on commodity dependence, there are still plenty I could have added (e.g. price and income inelasticities, the LAC manufacturing sector, other Chinese activities in Latin America such as FDI and loans). However, the more variables I include in my analysis, the more risk of a rise in “(...) the variance of the estimator of the coefficient of interest” (Hanck et al. 2021). As I have mentioned above, fixed effects do control for omitted variables. Random effects, however, do not. All in all, I do believe my analysis has a fairly high degree of internal validity.

Meanwhile, *external validity* refers to the extent of which I can generalize my analysis to other populations and environments. I have already covered the relationship between my variables (see section 3.2). When it comes to my units, my analysis includes 2/3 of the countries in the region of interest, and therefore one could argue that my units are representative of the region. However, I can in no way claim to have a high degree of external validity: my analysis revolves around how trade with China affects Latin America and the Caribbean as a region. Evidently, my findings will illustrate the impact of Chinese trade on that region only. It would be highly problematic for me to generalize my findings from the Sino-Latin American trade to other parts of the world, as for example the Sino-African relationship. And therefore, my analysis has a low degree of external validity.

My justification for starting in 1990 is that Sino-Latin American trade was minimal before this time. It was during the 1990s that China's trade with Latin America was slowly increasing, and when the influence of the United States was (and still is) prevalent (Gallagher and Porzecanski 2011, 463). In this way, we can capture the decline of US influence and the increase of Chinese influence on the continent. Starting from 1990 might provide an interesting take on whether this really took place. A further argument for starting in 1990 is that, given that I am operating with a lot of variables in my analysis, I am lacking a lot of data for earlier eras. But I end in 2019 for one primary reason: because the corona pandemic is likely to disturb the *ceteris paribus* principle which I wish to achieve in my analyses. As mentioned above, I will carry out a FE and RE model. However, by virtue of comparison and serving as an introductory component to my analysis, I will start with a linear probability model (LPM).

#### **4.1.1 Three-step analysis**

##### ***4.1.1.1 First step: Ordinary Least Squares (OLS) Linear probability model (LPM)***

In the first part of my analysis, I will carry out a linear probability model, which in simple terms is the use of OLS with a binary DV. My dependent variable will thus be binary, where 1 will represent commodity dependence (above 60% commodity export share), and 0 will represent absence of commodity dependence (below 60% commodity export share). Since the analysis seeks to assess LAC commodity dependence, all 22 Latin American countries and the time period 1990-2019 will be included. The coefficients in this model will be interpreted as probability estimates of an outcome taking place (in my case commodity dependence). As my LPM is going to be based on pooling, an OLS approach, I will now explain what it is. OLS, or ordinary least squares, is a linear least squares method for estimating the unknown parameters in a linear regression model by drawing a line that shrinks the sum of the variables' squared residuals (Kellstedt and Whitten 2018, 193).

The 'pooling' method is so called as it 'pools' all the observation into one regression. While it is true that logit and probit models are often to be preferred to the LPM when dealing with a binary dependent variable, there is a case to be made that in certain cases, the LPM is just as valid, if not more than its rivals (Horrace and Oaxaca 2006, 321-322). For instance, units belonging to the same class (as is the case with my Latin American countries) cannot be estimated with probit or logit models, unlike LPM. This is after all a common occurrence in

panel data (which is the research design I employ). Also, the LPM is known to produce just as robust estimates in large-N analyses (which mine is) as the probit and logit models (Chatla and Shmueli 2016, 4). In fact, “in large samples the LPM produces results ‘similar’ to logistic and probit regression models” (2016, 12). Chatla and Shmueli argue that “LPM performs similar to logistic and probit models in terms of coefficient significance, effect size (marginal effect), classification and ranking” (2016, 30).

Further, unlike the probit models, one can simply insert the data as it is into the model without the necessity of further computations, and then simply calculate the marginal effects of the estimations. The ease in which one can interpret the results of an LPM makes it a favourite among many social scientists (2016, 10, 33). However, LPM does have its disadvantages, primarily being inferior when estimating probabilities and the presence of heteroscedasticity and non-normality in its models. The latter point tends to make LPM unsuitable for small-N analyses. As my sample size is large, and my goal is to rank Latin American countries’ commodity dependence, and of course since the LPM will only serve as an introductory component, I find LPM suitable for my analysis. To demonstrate that the relationship between my dependent variable and my predictor variable is linear, I have added a scatterplot (see Appendix B). After the LPM, I will lead a FE model with the same DV.

#### ***4.1.1.2 Second and third step: Fixed effects (FE) model and random effects (RE) model: the effect of trade with China on LAC commodity dependence***

So, in the second phase of my analysis, I will carry out a fixed effects model estimating the effect of commodity exports to China on LAC *commodity exports as % of total exports*. The final step of my analysis will carry out a random effects model, this time assessing the effect of commodity export to China on LAC total natural resources rents share of GDP. Now, before we move further, what is it that defines the FE and RE model? What differentiates them from each other? Choosing between FE and RE is tricky, as social scientists still haven’t reached a conclusion on when each are applicable (Urdinez and Cruz 2021, 161). In essence, RE and FE deal with unobserved effects in the error term. The assumption is that there might be factors not included in the analysis which affect the influence of my IV on my DV (2010, 3).

Therefore, the primary difference between FE and RE is their perspectives on whether or not the error term is correlated with the included variables in the model or not. This, in turn,

affects how they treat the error term. As FE models assume that the error terms between the units *are* connected to the explanatory variables, it creates a dummy variable for each unit which controls for all inter-unit variance. Each of these dummy variables have their own, separate intercepts (excluding one unit, a reference unit, as is natural with dummy variables). FE does *not* assume that the relationship between the predictor variables and the error terms are connected, rather allowing for it to be tested.

Meanwhile, as RE does not assume that there is a correlation between the predictor variables and the error term, it does not create a dummy variable: rather, it distributes the error terms of all the units on the predictor variables like a sample from a normal distribution, thus in a random way (hence the word ‘random’) (Bell, Fairbrother and Jones 2018, 1060-1061). In short: FE gathers the error terms in individual dummy variables, while RE distributes the error term on the predictor variables randomly. The benefits of the RE are that they allow their units to be correlated with each other and their environments. In this manner, it can provide detailed calculations on their units (through ‘shrunk’ residuals), unlike FE which has reduced them to dummy variables. RE can also control for the reliance (or lack thereof) of these unit estimates. However, RE has its flaws, including the tendency to incorrectly assume homogeneity and their inability to control for omitted variable bias (Bell, Fairbrother and Jones 2018, 1062).

FE has many advantages, including their ability to control for omitted variable bias (unlike RE) and their easy-to-use nature in regression models. And unlike RE, FE draws estimated parameters for each cross-sectional unit. Further, they allow for looser, undefined connection between included and excluded variables (2010, 281-282; 2010, 285-286). But FE also have weaknesses. For instance, FE are unable to pick up sample-to-sample variability, and their dependence on parameter estimations reduce their credibility and may lead to high coefficient standard errors. However, by including country and year dummy variables in my model, I can include the sample-to-sample variability. As I have now explained the most vital differences between FE and RE, as well as their advantages and disadvantages, I will now move on to explain how I will solve multicollinearity.

## 4.1.2 Solving multicollinearity

### 4.1.2.1 *Two-way fixed effects model*

As mentioned above, for my FE model I will add country and year dummy variables, for the sake of a proper estimation of the regressions. To avoid the ‘dummy variable trap’ (i.e. perfect multicollinearity), I will of course add a reference unit for each dummy variable (Bobbitt 2021). My reference country will be Mexico, and my reference year will be 2019. For my fixed effects, I will employ the *two-way fixed effects* (the term ‘two-way’ referring to controlling for two dimensions: units and time) (Wooldridge 2021, 2). The variation that we now get will be the change observed for that individual for that specific year. Why would I need such a ‘reference individual’? Because excluding it would make it impossible to assess the model with every individual included. By adding a reference unit, we can contrast the rest of the categories in the dummy variables with these units, and the importance these have in relation to each other.

Thus, we also avoid multicollinearity, which is the phenomenon of two or more variables being dependent on each other (Monogan III 2015, 93). The ‘reference individuals’ are still present in my models, but they will not have their own coefficient. It is however important to mention that the fixed country variable affects the fixed year variable, and the other way around. And with two-way FE, the country variables which vary a lot in time tend to be prioritized in the analysis when estimating the effect of the treatment variable. This method of adding a dummy variable for each country except for one is not advised if I have hundreds or thousands of individuals, as it obviously can lead to an endless list of terms. But as I ‘only’ have 22 countries, it should not be a problem (Huntington-Klein 2021).

Now, why is multicollinearity an issue? First of all, because, when your data has ‘perfect multicollinearity’, the variables will have unlimited standard errors, and therefore will be very difficult to properly estimate. Secondly, since they are co-dependent, their coefficients will move conditional on each other (and therefore the *ceteris paribus* assumption is violated). In other words, your regression results cannot be trusted (Bobbitt 2021). There are two ways to avoid multicollinearity: either remove the variables which have multicollinearity, or combine the variables in question into one variable if possible (for instance an index). One of my variables proved to have multicollinearity (*International Commodity Prices*), and therefore I chose to remove it from my analysis (Urdinez and Cruz 2021, 116; 2021, 119).

#### **4.1.2.2 One-way random effects model**

For my RE model, however, I will not add country dummy variables, as that would make it impossible for me to assess the country random effects, as all the country-level degrees of freedom are absorbed by these fixed effects. Instead, I will carry out a *one-way* random time effects model, where I will include time dummy variables. This gives me the opportunity to investigate discrepancies in error variance components over the time period in question (1990-2019) (Park 2011, 7). I will also utilize a dummy variable of one of my DVs later, *the commodity exports share of total exports* variable, and my reference unit for this variable will be the number 58.

#### **4.1.3 Adding control variables (CV)**

By adding CVs to my regression, I contribute to close the path from the treatment variable to the outcome variable, and I also avoid spuriousness and a type I error rate (i.e. falsely accepting the null hypothesis) in the process. Needless to say, then, when choosing our IVs and CVs, we need to make sure that they are unrelated to one another. In simpler terms: I choose control variables in my attempt to achieve the *ceteris paribus* principle as much as possible (Urdinez and Cruz 2021, 91). In this regard, it might be tempting to add as many CVs as possible to your analysis, as one might be nervous about having ignored important variables. However, having *too many* CVs in the analysis can be a mistake, as it can increase the risk of multicollinearity (Wooldridge 2009, 203-205). Generally, we most often do not know which effect adding an extra control variable will have on the model. In fact, no regression covers all the relevant observations, much less can it predict any outcome flawlessly. In fact, in many cases, what the regression results don't say are equally as important as what the results do say (Huntington-Klein 2021).

#### **4.1.4 Solving missing values: MICE**

Few datasets get by without some missing values, including mine. My dataset is unbalanced, as my countries vary in how much information they have. The countries with the most values (Brazil, Colombia, Ecuador) have 28 out of 30 years with complete information, while the country with the least values (Bahamas) has 12 out of 30 years with complete information. As I have mentioned earlier, I have deleted the countries which had insufficient available data. Still, the missing values in my dataset constitute 9.3% of my total data. This puts my proportion of missing data just under the 10% mark: as explained by Dong and Peng (2013, 2)

missing values constituting 10% or more can lead to bias in statistical analysis. To mitigate the risk of this bias, I have decided to handle the missing data with multiple imputation. To the uninitiated, I can inform that multiple imputation is a method of handling missing values by replacing them with many different calculations to choose from which are based on the existing values in the dataset.

The many different calculations help to mitigate bias, improve precision and strengthen the validity of your results (Glen 2017). Lall (2016, 414) argues that “Political scientists increasingly recognize that multiple imputation represents a superior strategy for analyzing missing data to the widely used method of listwise deletion”. But before I decide which imputation method to utilize, I have to land on whether I consider my missing data to be Missing At Random (MAR), Missing Completely At Random (MCAR) or Missing Not At Random (MNAR). I notice a trend in my dataset: the missing trade data is missing in mostly the same places as my institutional quality (Rule of Law) variable. We can also see that the institutional quality is very low at every point right before the data is missing. Therefore, the reason that the data is missing could be due to lack of statistical reporting capacity in the respective countries.

And thus, my assumption about my data is that the non-recorded data is missing at random, which means that the non-missing values are mostly dependent on observed values of variables and not unobserved values on variables being missing (Sorens and Ruger 2012, 430). The likelihood that the value of an observation is missing is therefore singularly dependent on available information. Assuming that my missing values are missing at random, I will use Multivariate Imputation by Chained Equations (MICE). This is a data simulation method where missing values on observations are filled through randomly matching it with values from units whose predicted values are most similar to the predicted value of the missing data. MICE carries out multiple iterations, meaning that it imputes the missing values several times and combines the results to achieve the most suitable replacement for the missing data points. With the assumption of data being missing at random, the MICE method were used for the multivariate imputation process to reduce the missing data issue (van Buuren and Groothuis-Oudshoorn 2011). Graphs representing the steps made with MICE are to be found in Appendix A.



#### **4.1.5 Standard errors, clustering and autocorrelation**

Now, let's cover the topic of standard errors (also called the error term). In simple terms, standard errors are the difference between the results you predict and the results you get, and are based on the variance of the variables. The standard error informs us about the sampling distribution, which notifies us about the range of plausible estimates, confidence intervals (henceforth referred to as CI), statistical significance, and removing specific population distributions as implausible. They are all observations that affect the DV without being incorporated into the model. Therefore, I must assume that my IV is as little affected by standard errors as possible, and control for other variables which I expect can affect the standard error most significantly.

However, if the regression has not been conducted properly, the standard error will be wrong, which may distort your research results. We must make a couple of assumptions regarding the standard error. First, we need to take for granted that the standard error is normally distributed. By this conjuncture, we can assume that the OLS estimates are distributed normally. Admittedly, OLS coefficients often have sampling distributions irrespective of an abnormal standard error. Secondly, we have to assume that the standard errors are "(...) independent and identically distributed" (Huntington-Klein 2021). In other words, we need to presuppose that the distribution of the standard error is unaffected by the standard error of the other variables and observations. Also, observe in Appendix B that my variable Total natural resources rents is highly skewed. Had I had more time, I would have log transformed it, as skewedness can significantly negatively impact your statistical results. Do keep that in mind when I present my results from Table 4.

#### **4.1.6 Solving autocorrelation: clustered standard errors**

That second assumption is a bit trickier to accept in the case of two-way FE, since I have many observations from the same individual variable. What does this mean? Well, since in my case I am analysing exclusively countries from the same region, Latin America and the Caribbean, I need to come to terms with the ability that there are some common unobserved variables affecting the error term of my country variables. This can make their error terms correlate, which would distort and misestimate my standard errors. Further, we need to expect that the sampling distribution is equally distributed for every observation. Noted, the standard error can be higher or lower in some observations than others, but the important thing is that it is obtained from the same distribution.

If these assumptions are wrong, we might be left with a problem of *autocorrelation*, which is when standard errors are correlated across variables and/or observations due to similar or identical qualities, and form clusters (hence the name). This is a common occurrence when working with data across time (including panel data), called ‘temporal autocorrelation’, and in geographically clustered data, called ‘spatial autocorrelation’ (Huntington-Klein 2021). Why is this a problem? Because this kind of clustering can significantly weaken your analysis results, including deceptively small p-values, exaggerated t-values, narrow CIs, distorted assumptions of independence and significantly smaller standard errors than what you would find in a ‘normal’ OLS (Glen 2017). Which in turn can lead to wrong conclusions.

Fortunately, we have a solution: clustered standard errors. Clustering standard errors lets the values of one IV transact with other values of the IV in the same group, in addition to estimating the standard errors while leaving some room for correlation between the error terms. Clustered standard errors can control for any correlation inside each cluster. This relieves us of making constraining assumptions of a zero-level standard error. But before I cluster the standard errors, I again need to make a couple of assumptions. First of all, is there *treatment effect heterogeneity*? In other words, is the treatment effect different across the individuals? As we see from my analysis, the effects differ widely, and thus it is safe to say that my country variable fits this description. Secondly, are the FE units that are meant to be clustered a “(...) non-random sampling of the population”? As I have cherry-picked exclusively countries from one region, it is safe to say that my country variable checks this box.

But I cannot just cluster without rhyme or reason: if, for example, I cluster the standard errors at too high level, I can get an unnaturally high standard error. I will have to decide for myself how far I want the clustering to expand, backed up by theoretical foundations. Since it is important that I cluster the standard errors at the same level as the FE, I will cluster the standard errors by country. I base this choice on my choice of exclusively Latin American and Central American countries. Given their geographical proximity and uniqueness, I believe it is safe to assume that these countries share environments, and therefore their error terms can be expected to be correlated.

#### **4.1.7 Solving heteroscedasticity and autocorrelation: the *Driscoll-Kraay* and *White* estimators**

Another issue that might arise from the lack of independent and equally distributed standard errors is *heteroscedasticity*, the phenomenon when the variance of the standard error's distribution is linked with the variables in your analysis. The risk may be that the standard errors are biased, in that they are too small. For the sake of spotting heteroscedasticity in my FE model, I have made a Pearsons residual plot, which includes the whole model (Monogan III 2015, 89, see Appendix B). As we can see, the relationship between actual and predicted values is nonlinear, implying heteroscedasticity.

There could be an argument for taking into account the countries which do not trade much ewith China, as they can lead to an uneven distribution of the standard error. However, my statistics show me that all the countries included in my analysis trade with China practically all the years covered. However, it is true that countries which trade a lot with China will most likely have a high variance in the standard error, while the countries that trade minimally with China have a low degree of variation in the standard error. That would mean that "(...) the error distribution isn't identical because the variance of the distribution changes with values of the variables in the model" (Huntington-Klein 2021). Fortunately, there are many solutions to this problem, one of which is a so-called "sandwich estimator", in which the individual variance values of the IV are increased or decreased or multiplied by the values of the IV's observations.

For my FE analysis, I will use the Driscoll-Kraay sandwich estimator, which controls for heteroscedasticity, residual errors and autocorrelation. For my RE analysis, however, I will utilize the White covariance matrix estimator, which functions much in the same way, as it reduces heteroscedasticity and residual bias (White 1980, 827-828). Lastly, before I move on to the data section, I have to decide which heteroscedasticity-consistent estimator I will employ. For the sake of checking for robustness, I will utilize two of these estimators, the HC3 and the HC4. The HC3 is considered the most ideal compared to the HC0, HC1 and HC2. This is due to its characteristics; exceptional small sample qualities. However, HC3 can generate liberal bias in notably small samples, can be flawed in the case of specific cases of heteroscedasticity, and it is not ideal in the case of high leverage. However: the HC4 happens to be most convenient in the case of high-leverage data.

Further, HC4 “can outperform HC3 in terms of test size control when there are high leverage points and nonnormal errors”. Hayes and Cai in fact state that HC3 and HC4 “(...) can function as a sedative of sorts for the data analyst anxious about the possible effects of heteroscedasticity on the validity of inferences and power of hypothesis tests in OLS regression” (2007, 713-714; 2007, 716). He recommends, along with Long and Ervin (2000), that researchers utilize HC3, at the minimum to control for heteroscedasticity, and it can also be convenient in estimating standard errors. In the event of data with high leverage, H4 is recommended. For the sake of robustness, I will utilize both. In sum, I have controlled for clustered standard errors, heteroscedasticity and temporal and special autocorrelation. Further, I have added CVs and removed between-variation through FE to reveal potential effects that may hide in the standard errors of my treatment (independent) and outcome (dependent) variables.

## **4.2 DATA**

In this section, I will elaborate on the variables I will use in my model estimations. I will carry out a three-step analysis: 1) linear probability model, 2) Fixed effects model on commodity exports share, and 3) Random effects model on total natural resources rents. All models will have their separate DVs, all representing commodity dependence. I will now start by presenting my DVs. As I have stated in my Section four, I have three, where two of them are two separate measures of my first DV: one dummy variable and one percentage variable. Thus, my three DVs are: 1) Commodity exports share of total exports dummy variable, 2) Commodity exports share of total exports percentage variable, and 3) Total natural resources rents as percentage of GDP. Remember that all my DVs will be lagged by one year. Then I will move on to my IV, before I present my CVs. The IVs and CVs will be the same, given that the dependent variables represent the same phenomenon.

In my attempt to avoid potentially omitted bias, my CVs will be both structural (i.e. GDP growth, commodity exports to USA, capital imports from China, rule of law) and external (i.e. trade openness). My variables are from several datasets, more specifically the Economic Commission for Latin America and the Caribbean (ECLACSTAT), the Penn World Tables, the United Nations Conference on Trade and Development (UNCTADSTAT), Varieties of Democracy Version 12 (V-Dem), World Integrated Trade Solutions (WITS) and the World

Bank. I will now elaborate on the variables included in my analysis, starting with my dependent variables.

#### **4.2.1 Operationalizing my dependent variable (DV) #1: Commodity exports share of total exports, dummy variable**

My first DV is *commodity export share of total exports*, operationalized to ECLACStat's 'Exports of primary goods as share of total exports'. This variable includes commodities such as tobacco, minerals, vegetable and animal oils and the like. Therefore, this variable is a proper measure of commodities. This is a dummy variable, where 0 is 59.9% commodity exports share or below, while 1 is 60% commodity exports share or higher. The implication is that once a country reaches level 1, they are officially considered commodity dependent, in accordance with the UNCTADs definition of commodity dependence (2019). This variable is sourced from ECLACSTAT.

#### **4.2.2 Operationalizing my dependent variable (DV) #2: Commodity exports share of total exports, percentage variable**

This DV is the same variable as above, *commodity export share of total exports*, operationalized to ECLACStat's 'Exports of primary goods as share of total exports'. What differentiates this DV from the first DV is that this variable is measured in percentage, and therefore rests on a scale from 0 (no commodity exports) to 100 (only commodity exports).

#### **4.2.3 Operationalizing my dependent variable (DV) #3: TOTAL NATURAL RESOURCES RENTS (% OF GDP)**

The final DV measures total natural resources rents as percentage of GDP. This includes the annual sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. The variable measures on a scale from 0 (0 of the government revenue is from natural resources rents) to 100 (all the government revenue comes from natural resources rents). This variable is sourced from the World Bank.

#### **4.2.4 Operationalizing my independent variable (IV)**

For my models, I have only one IV: *commodity export product share to China in %*. Thus, it is a percentage variable, on a scale from 0 (no commodity exports) to 100 (the export basket only consists of commodity products). This variable is taken from WITS.

**6.3. Operationalizing my control variables (CV)**

My seven CVs are the following: First is the *Chinese capital imports as percentage of total imports*, which is measured in percentage and operationalized to ‘Imports product share capital goods’ from China, sourced from the WITS database. Secondly, the *commodities export product share to USA in %*, which is also a percentage variable based on the ‘imports product share capital goods’ from USA. This variable is also taken from the WITS dataset. The third CV is *Trade Openness*, in which I utilize the Penn World Tables’ ‘Trade Openness, 1990 to 2017’ variable. This variable measures the sum of a country’s exports and imports as a share of that country’s GDP in percentage. Further, I have chosen to include two variables for economic growth; one that measures aggregate economic growth (*GDP aggregate growth*, measured through the World Bank ‘GDP Growth (annual %)’ variable) and one that measures GDP growth per person (*GDP per capita growth*, operationalized to the Penn World Tables’ ‘Per capita GDP growth). The purpose is to measure economic growth at the micro and macro level. I might have added other relevant CVs, such as exchange rate, fiscal public expenditures, remittances, tourism, foreign aid, and colonial origin. However, as mentioned, to avoid multicollinearity, I will stick to these CVs, which I believe to be most relevant in this context. Before I move on to my analysis, I will delve into the problematic aspects of my sources.

**4.2.5 Problematic sources**

Given that one of my sources is the World Bank, it would be uncritical of me if I did not mention the recent stain on their reputation: the 2017 data-rigging scandal in favour of China (Shalal and Lawder 2021). The implication is that one should be a bit sceptical about utilizing data from the World Bank, as the organization has a history of manipulating data in favour of a country. Further, Chinese economic statistics has a questionable reputation (Illmer 2016). Luckily, given that I am assessing exports and imports, this is something that can be estimated by China’s trading partner, in this case Latin American countries. Thus, we (most likely) avoid the risk of Chinese data-tempering. Moving on, I will now present the descriptive statistics of my variables.

Variable	Mean	Standard deviation	Min	Max	Source
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Commodity Export Share % of total exports), t-1	65.77	22.77	3.00	99.40	ECLAC/CEPALSTAT
Commodity export share to China (%)	47.18	28.09	0.05	100.00	WITS
Capital import share from China (%)	25.86	15.99	0.10	92	WITS
Commodity export share to USA (%)	33.65	22.69	0.01	92.00	WITS
Total Natural Resources Rents (% of GDP)	4.19	4.93	0.00	31.66	World Bank
Trade Openness (%)	33.30	16.29	6.25	115.55	UNCTADSTAT
Rule of Law Index					V-Dem
National GDP Growth (%)	3.157	3.27	-10.89	14.44	World Bank
GDP per Capita Growth (%)	0.02	0.05	-0.25	0.29	World Bank

**Table 1:** Descriptive Statistics.

As you can see, all my variables are continuous, and therefore they are easy to measure.

While most of my variables are measured in percentage, on a scale from 0 to 100, Rule of Law has an index, and the GDP variables are measured in percentage growth, which differ slightly from the standard percentage variables measured from 0 to 100. I will now embark on my analysis.

## 5 RESULTS

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And finally, we have arrived at the empirical analysis section. As you already know, the primary goal of my analysis is to assess whether trade with China increases or decreases Latin American commodity dependence, with theoretical basis in the Dependency theory. My analysis will be divided in four. First, I will present some relevant graphs to demonstrate 1)

the nature of LAC commodity exports basket to China and USA. The purpose of this graph is to illustrate the nature of LAC export share to China and USA, differing between four types of export goods. Secondly, I will illustrate the evolution of individual commodity export share between LACs from 1990 to 2019. Both of these graphs are intended to show a historical dimension to commodity exports share, and what the graphs say about whether China or USA might lead LACs to commodity dependence. Next, I will implement a linear probability model (LPM) with a binary commodity export share variable. The purpose of the LPM is to provide an introductory component to my analysis, presenting an indicator on what leads to an increase or decrease in commodity dependence.

Following this thread, as a third stage, I will conduct a FE model of this same relation between commodity exports share to China and LAC commodity dependence (represented by a commodity export share percentage variable). Given that I consider the FE models more robust, I will lend priority to their results. Then, as a final analysis, I will assess the connection between trade with China and commodity dependence (represented by total natural resources rents share of GDP). To further investigate the relationship between Rule of Law and total natural resources rents as proportion of GDP, I will also include a marginal effects interaction plot to test this relation. On a final note, I will elaborate on the robustness checks made in my models. As you know, researchers are seldom confident that their estimators are chosen based on valid assumptions. The aim of robustness checks is therefore to verify these assumptions made to advocate their choice of estimators (in my case variables) (Kennedy 2003, 372).

As a reminder, the hypotheses (i.e. assumptions) of this thesis are summarized:

**H1:** *Higher levels of commodity exports to China lead to greater commodity dependence.*

**H2:** *Higher levels of capital imports lead to greater commodity dependence.*

**H3:** *Higher levels of commodity exports to USA lead to greater commodity dependence.*

**H4:** *Higher levels of trade openness leads to greater commodity dependence.*

**H5:** *Higher degree of rule of law leads to a reduction in commodity dependence.*

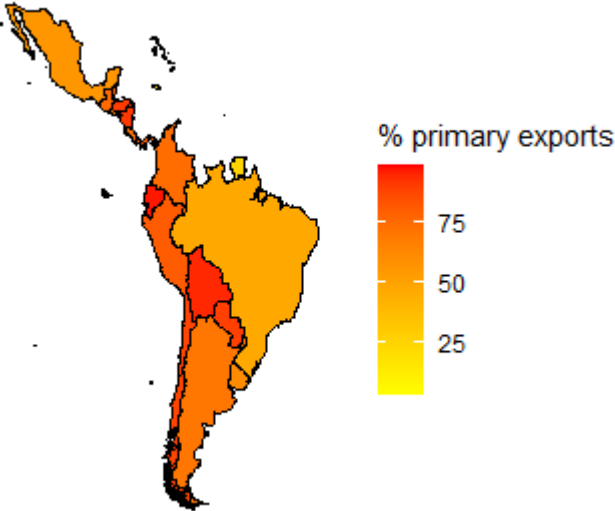
**H6:** *economic growth leads to increased commodity dependence.*

As I am carrying out three models with different parameters in this section, the results on each variable will be discussed in chronological order under each model. As explained above, I will start with some illustrative graphs. The theory outlined in Section Three seems to indicate



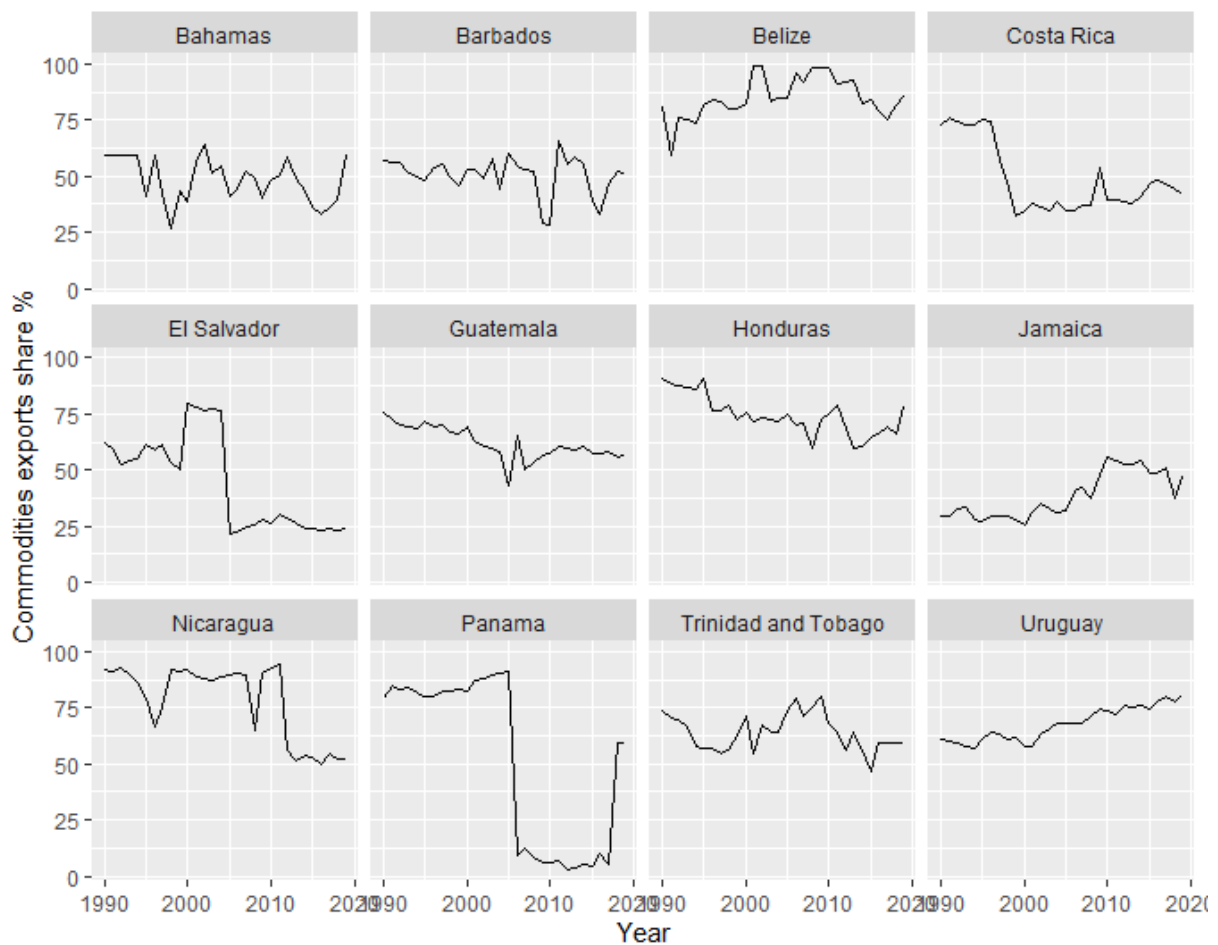
that Latin American countries are exposed to re-commodification due to the ever-growing proportion of commodities in their export baskets. But how large is this commodity export share? Let me illustrate.

**5.1 LATIN AMERICAN COMMODITY EXPORTS SHARE EVOLUTION**



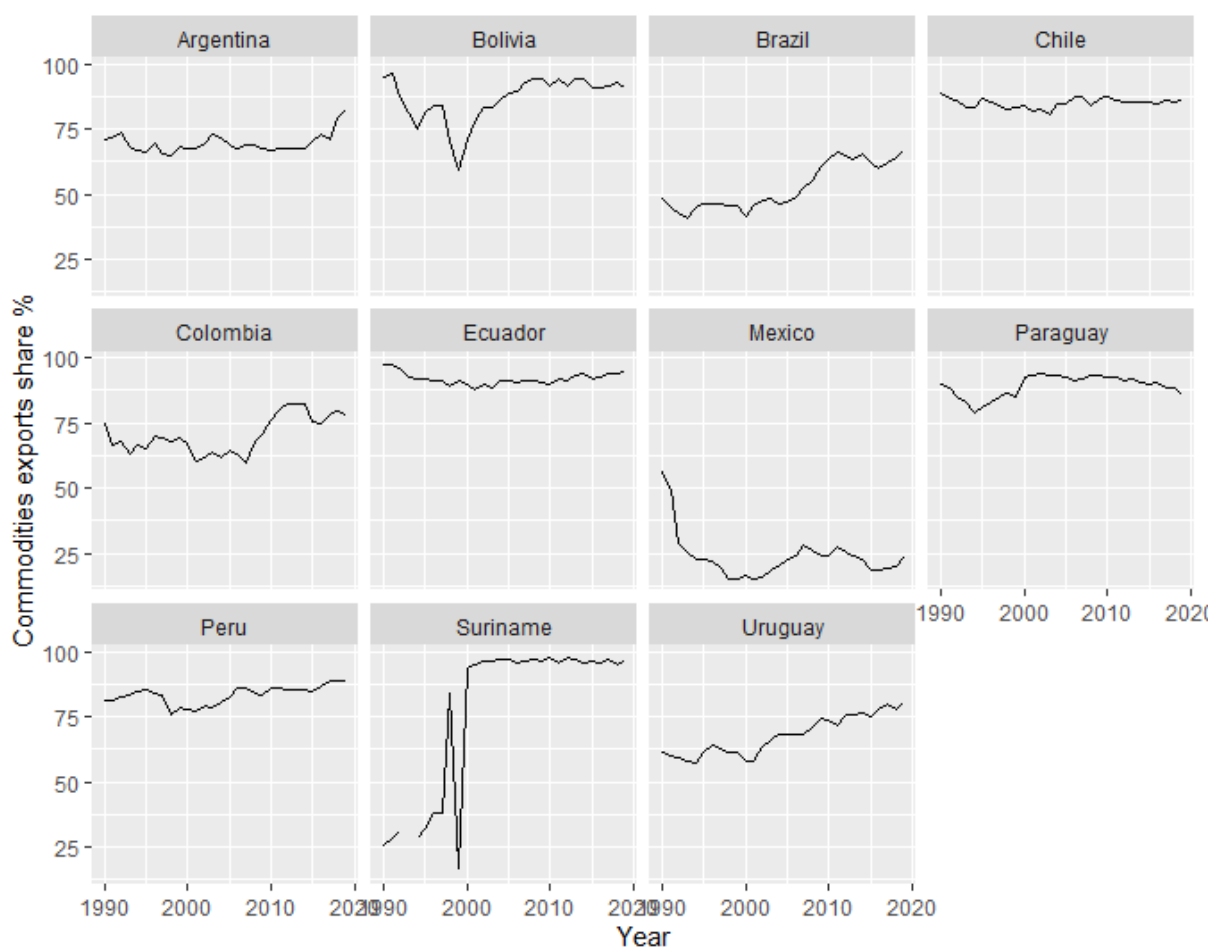
**Figure 3:** Map chart over average Latin American commodity exports as part of total exports in % 1990, 2019. Source: ECLACSTAT.

The map above demonstrates the mean commodity exports share of Latin American countries in the time period 1990-2019. The stronger the colour, the higher the commodity export share. Remember that UNCTAD considers countries with more than 60% commodity export share as commodity dependent. We can see that some countries have higher than 75% commodity exports share, where Bolivia, Paraguay, Ecuador, and Nicaragua seem the most prominent examples. Note how there is no geographical distinction between Central and South American countries with regards to commodity export share of total exports. Now, let us look at how primary exports share of total exports has evolved through the individual Latin American countries. I have divided the chart in two for the sake of avoiding a messy display, between Central and South American countries.



**Figure 4:** Primary exports share evolution for Central American countries, 1990-2019. Source: UNCTADStat.

As we can see, the primary exports share level varies among the countries. It is hard to speak of a generalized pattern. Most Central America countries fluctuate wildly in levels between the time period in question, between 1990 and 2019. The countries that stick out in unstable development are Costa Rica, El Salvador, Nicaragua and Panama. While Uruguay has seen a steady increase in primary exports share and Belize has experienced an overall increase, countries like Costa Rica, El Salvador, Guatemala, Nicaragua, Panama and Trinidad and Tobago have witnessed an overall decrease. Bahamas, Barbados, Honduras, and Panama have had significant differences in variance, but start and end at around the same levels of primary exports share. Panama stands out in primary exports share development. In sum: the Central American countries vary significantly in primary exports share of total exports. Now let us move on to the Southern American countries.

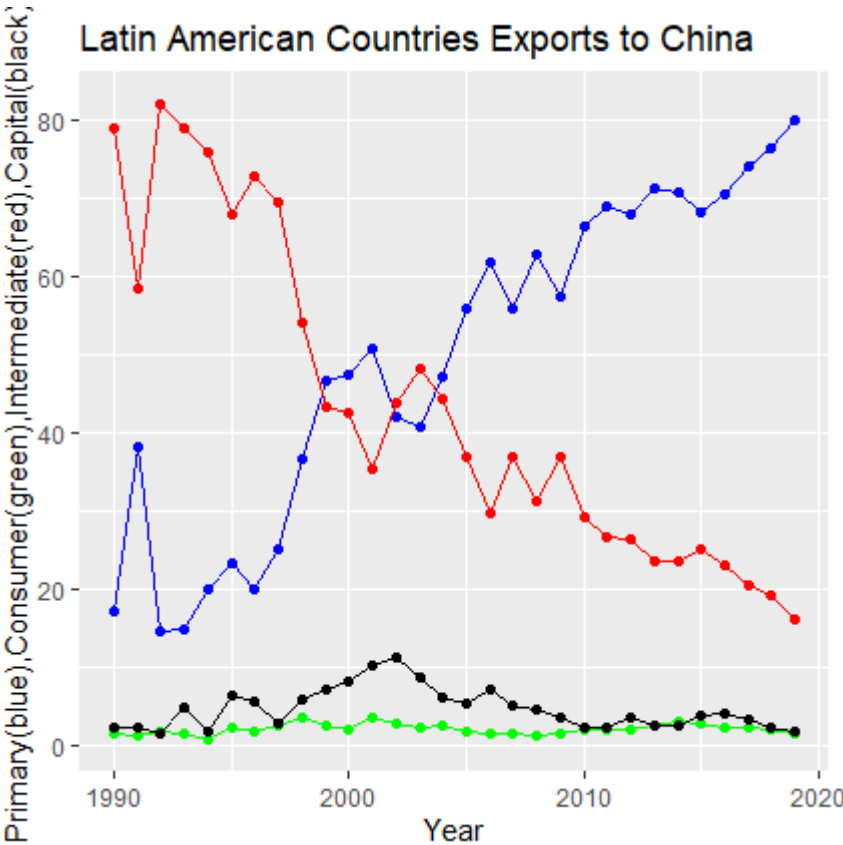


**Figure 5:** Primary exports share evolution for South American countries, 1990-2019. Source: UNCTADStat.

Although the countries vary significantly in development, we can see more of a general pattern here than the Central American countries. Most of the countries have either remained at the same level of primary exports share, or increased level of primary exports share. Argentina, Brazil, Colombia, Peru, Suriname, and Uruguay have increased their levels of primary exports share, and Bolivia, Paraguay (the first two admittedly with fluctuating levels), Chile, Ecuador have remained at relatively stable levels from 1990 to 2019. Mexico and Suriname stand out. Mexico went from above 50% primary exports share in 1990, to around 25% in 2019. Suriname was at around 25% primary exports share in 1990, and nearly 100%(!) in 2019. To sum up: we see a general pattern (with some exceptions) in South American countries, of overall increased primary exports share.

**5.2 LATIN AMERICAN EXPORT BASKET EVOLUTION TO CHINA VS USA**

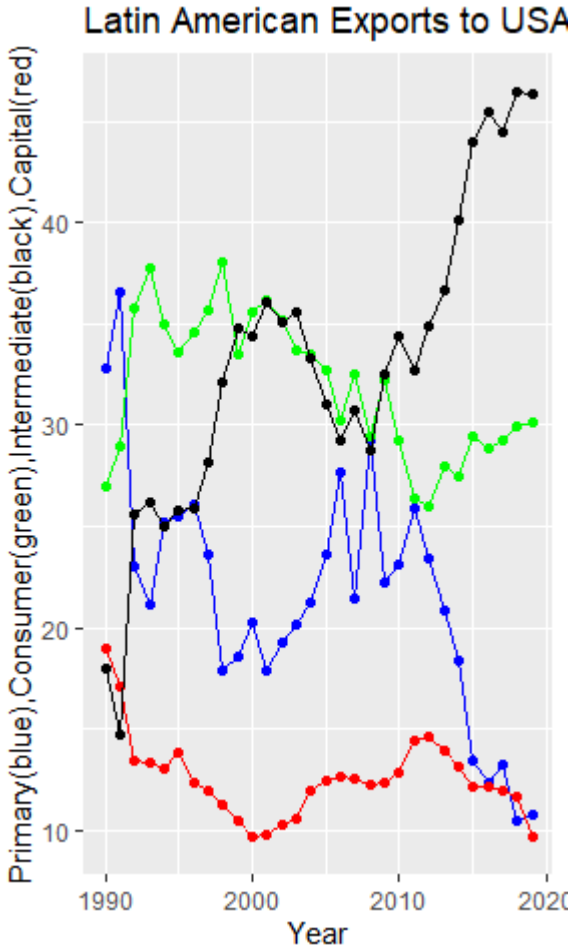
And so, we have found that the commodity export share among Latin American countries vary without a significant difference between Central and South America. But before we move along, it might be interesting to see what the statistics say about the trend with regards to export goods classification to China and the USA from 1990 to 2019. Below we can see the export share between commodities (here referred to as ‘primary’) and higher value-added products (referred to as ‘consumer’, ‘intermediate’ and ‘capital’).



**Figure 6:** Latin American and Caribbean exports to China by product classification, in percent of total exports. Source: WITS.

As demonstrated, consumer and capital exports to China are minimal. Intermediate exports were high in 1990, but have since been drastically reduced. Primary exports, on the other hand, while starting at a low level in 1990, have grown considerably to outmaneuver the other export classes since the 1990s. This trend does not seem to change, collaborating my H1.

Now let us look at what the chart says about export share to USA from 1990 to 2019.



**Figure 7:** Latin American and Caribbean exports to USA by product classification, in percent of total exports. Source: WITS.

As illustrated, LACs tend to export more advanced products to USA than China in the time period 1990-2019. Intermediate exports have been on a significant rise in recent years. Primary exports, which in 1990 were the most exported product group, have declined drastically to being almost nil today. Therefore, the data do seem to indicate that China is leading Latin American countries towards increased commodity dependence, while USA does not. In other words, these charts lend support to my H1, but not to my H2. Admittedly, these charts say nothing about the volume traded. By that I mean that even though commodity export share to China was to represent 100% and commodity export share to the US was 40%, the US effect would still be larger if commodity exports to US constitute a much higher volume (most often represented in US\$) than that to China. So do bear in mind that these charts do not necessarily paint the whole picture. To further assess the Chinese vs US influence on Latin American commodity dependence, I will now carry out an LPM.

### 5.3 LINEAR PROBABILITY MODEL: DOES TRADE WITH CHINA INCREASE LATIN AMERICAN COMMODITY DEPENDENCE?

In the following LPM my DV (commodity exports share), which represents commodity dependence, will be a dummy variable. Thus, if an explanatory variable has a significant positive (negative) value, this indicates the degree to which one unit increase in this variable increases (decreases) the likelihood that a country will (not) become commodity dependent (Kennedy 2003, 259). Do note that I will only be elaborating on the coefficients with statistically significant values. The simple reason for this is that the null hypothesis for these variables has not been disproven, demonstrating that the causal relationship might be due to chance (Kenton 2022). Therefore, we cannot know whether the causal relationship between this variable and the dependent variable is due to anything other than chance, rendering the variable irrelevant. Given that LPMs are notoriously known for being heteroscedastic by default, I will add Driscoll-Kraay (HC3) standard-errors to mitigate this trend. And finally, before I start: as my variables are mostly all percentage variables, and the remaining variable, Rule of Law is an index measured on a continuous scale from 0 to 1, I did not find it necessary to log my variables. Instead, I will calculate the marginal effects from the regression tables.

**TABLE 2 - Regression table - Linear Probability Model (LPM) Dummy variable of Exports of commodities as share of total exports, t-1**

	<i>Dependent variable:</i> Exports of commodities as a share of total exports, dummy, t-1
Commodity export share to China (%)	.401* (.221)
Capital import share from China (%)	.003*** (.001)
Commodity export share to USA (%)	-.0002 (.003)
Trade Openness (%)	.007*** (.002)
Rule of Law Index	-.001 (.001)
National GDP growth (%)	-.235 (.211)
GDP per capita growth (%)	.014 (.010)
GDPpcgprwt	.487 (.430)
N of obs	n
Observations	660
R <sup>2</sup>	.275
Adjusted R <sup>2</sup>	.267
F Statistic	35.367*** (df = 7; 652)

Notes: LAC Exports of primary products as share of total exports, binary. This is a dichotomous measure of LAC commodity exports share of total exports for 22 Latin American countries, 1990-2019. Value 1 = 60% commodity exports share or above, which indicates commodity dependence. Value 0 = below 60% commodity exports share, indicating noncommodity dependence. Missing data for Missing data imputed through Multivariate Imputation by Chained Equations (MICE). Model applies heteroscedasticity-robust (HC3) Driscoll-Kraay standard errors, clustered by country. Data are sourced from CEPALSTAT, Penn World Tables, UNCTADSTAT, V-Dem, WITS, and World Bank. \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

**Table 2:** Linear Probability model (LPM) w/ Driscoll-Kraay (HC3) standard errors, clustered by country. DV: Commodity exports as share of total exports, dummy, 1990-2019.

Above we see a LPM model, represented with Driscoll-Kraay standard errors, clustered by country. This model has a binary variable, and therefore I will interpret the coefficients as the

change in likelihood that a LAC becomes commodity dependent (1=commodity dependent, 0= not commodity dependent). The intercept demonstrates the expected average sum for the DV when the effects of the other variables equal zero. We see that the intercept here is 0.401. Observe that its standard errors are relatively high (0.221). The standard errors imply how much your sample mean corresponds with the real population mean. If the standard error is high, it signifies that the sample mean is not an accurate rendition of the true population mean. Commodity exports to China is highly significant at the 0.01 level, with a low coefficient (0.003). This is an indication that every one-unit increase in commodity exports share to China increases the chance of an LAC becoming commodity dependent by 0.003 points. Further, it has very low standard errors (0.001). Thus, the commodity exports to China variable is highly concentrated on the population mean, lending it accuracy. This finding supports my hypothesis H1. Moving on, we see that capital imports from China is insignificant, which means that my hypothesis H2 is not supported.

Commodity exports to USA is, like commodity exports to China, strongly significant at the 0.01 level, and has a more than twice as high coefficient than commodity exports to China (0.007). This indicates that, *ceteris paribus*, every one unit increase in commodity exports share to USA increases the probability of an LAC becoming commodity dependent by 0.007 points. It also has low standard errors (0.002), indicating that the results are accurate. These findings therefore support my hypothesis H3, indicating that not only does USA have a positive effect on LAC commodity exports share, but also that commodity exports to USA have a greater positive effect on Latin American commodity exports share than commodity exports to China. Moving on, *Trade Openness*, *Rule of Law* and GDP growth are insignificant. This refutes my hypotheses H4, H5 and H6.

Then we have the model statistics. There are 660 observations in the model. The R2 is an estimate of how much the variance of the DV is explained by the model. In Table 2, the R2 grants this model an explanatory power of 27.5% (do know that a model can be highly significant even when the R2 is low) (Huntington-Klein 2021; Hermansen 2019, 130). Adjusted R2 is the same as R2, only that it calculates the variance explained beyond what you would expect by including a random variable in your statistic. Adjusted R2 is here predictably a bit more conservative, granting our models an explanatory power of 26.7%. The F statistic is basically a hypothesis test, utilizing a variance analysis (ANOVA) for each model (2019, 130). It compares the predictions (the squared sums) with a “zero model” (a model with a

constant, but no variables). The higher the F-statistic, the greater the gap between our model and this “zero model”. We can see that the F-statistic for Table 2 is both of high value and highly significant, at the 0.01 level (35.367). However, as I have mentioned earlier, LPM is known for its inferior probability estimates, so for the sake of verifying my results, I will now introduce my FE models.

#### 5.4 FIXED EFFECTS MODEL: DOES TRADE WITH CHINA INCREASE LATIN AMERICAN COMMODITY DEPENDENCE?

So far, we have provided charts on the distribution of commodity dependence in Latin America and an LPM which found that commodity exports to China and USA both had a significant positive effect on Latin American commodity dependence (more specifically commodity export share). I will now carry out my first FE model, as you can see in Table 3 below. Notice that I have added two models into my Table 3, each with separate heteroscedasticity-consistent estimators (HC3 to the left, and HC4 to the right). The intention is to ensure robust estimates. Thus, what is of essence when comparing the two models are the standard errors (as the coefficients are identical). Unlike Table 2, my dependent variable is now not binary, but continuous in the form of a percentage variable measuring commodity export share. The independent and control variables will be the same as in Table 2.

**TABLE 3 - Regression table - Fixed Effects Model (FE) LAC Commodity export share of total exports in % t-1, 1990-2019**

	<i>Dependent variable:</i>	
	(1)	(2)
	Commodity export share of total exports in %, t-1	
Commodity export share to China (%)	.0005 (.043)	.0005 (.043)
Capital import share from China (%)	.030 (.069)	.030 (.070)
Commodity export share to USA (%)	.444*** (.130)	.444*** (.130)
Trade Openness (%)	.014 (.047)	.014 (.048)
Rule of Law Index	2.460 (7.508)	2.460 (7.562)
National GDP growth (%)	-.305 (.393)	-.305 (.397)
GDP per capita growth (%)	28.867** (13.582)	28.867** (13.678)
N og obs	n	
Observations	660	660
R <sup>2</sup>	.249	.249
Adjusted R <sup>2</sup>	.215	.215
F Statistic (df = 7; 631)	29.848***	29.848***

Notes: LAC Exports of primary products as a share of total exports (Percentages of the total value of f.o.b. exports of goods) for 22 Latin American countries, 1990-2019. Missing data imputed by Multivariate Imputation by Chained Equations (MICE). Model applies heteroscedasticity-robust (HC3 and HC4) Driscoll-Kraay standard errors, clustered by country. Data are sourced from CEPALSTAT, Penn World Tables, UNCTADSTAT, V-Dem, WITS, and World Bank. \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

**Table 3:** Regression table w/ Driscoll Kraay (HC3 and HC4) standard errors, clustered by country. DV: Commodity exports as share of total exports 1990-2019.

As you can remember from my method chapter, there is no intercept in these models. This is because FE do not need them: FE include an intercept for all the individual countries. And thus, there is no single intercept for the FE model, rather one for each country. The



coefficients indicate how much the DV increases for each unit increase in the IV (Hermansen 2019, 131-132). First off, both commodity exports to China and capital imports from China are insignificant. Thus, in contrast to the LPM in Table 2, trade with China does not have any impact on LAC commodity dependence. In other words, Table 3 rejects my hypothesis H1 and H2. But in line with Table 2, Commodity exports to USA is still highly significant, at the 0.01 level, and its' coefficient is considerably high (0.444). In other words, every one-unit increase in commodity exports share to USA average LAC commodity export share by 0.444 points.

Given that it has moderately low standard errors (0.130), this is remarkable finding. Thus, it seems my findings support my hypothesis H3. Further, the variables Trade Openness and Rule of Law are again insignificant, dismissing H4 and H5. And lastly, we see that the GDP per capita growth is significant at the 0.05 level, with a very high coefficient (28.867). This would again indicate that one-unit increase in GDP per capita leads to an increase in LAC commodity export share by 28.867 points. But do note that GDP per capita growth also has high standard errors (13.582, 13.678) and not a strong significant value, weakening its accuracy and significance. In other words, Table 3 both supports and contradicts my H6.

Then there are the general statistics for the model. We see that obs=660 for both models and that R2 and Adjusted R2 give the models an explanatory value of 24.9% and 21.5%, respectively. Finally, the F statistic is highly significant, with a high coefficient (29.848). In other words, the model seems to have a moderately high explanatory value. The F statistic is therefore considerably lower than that of the linear probability model in Table 2. And now, for the sake of robustness, I will employ another DV, total natural resources rents as percentage of GDP, while all other parameters and variables will be the same.

TABLE 4 - Random Effects Model (RE) Alternative measure of commodity dependence: LAC Total Natural Resources Rents (% of GDP), 1990-2019

	Dependent variable:	
	Total Natural Resources Rents (% of GDP), t-1	
	(1)	(2)
Commodity export share to China (%)	-0.387 (2.608)	-0.387 (2.604)
Capital import share from China (%)	.002 (.005)	.002 (.005)
Commodity export share to USA (%)	.042*** (.016)	.042*** (.016)
Trade Openness (%)	.020** (.008)	.020** (.008)
Rule of Law Index	.020* (.012)	.020* (.012)
National GDP Growth (%)	1.595* (.846)	1.595* (.839)
GDP per capita growth (%)	.083* (.045)	.083* (.045)
GDPpcggrwt	.093 (2.995)	.093 (2.996)
N og obs	n	
Observations	659	659
R <sup>2</sup>	.083	.083
Adjusted R <sup>2</sup>	.073	.073
F Statistic	58.873***	58.873***

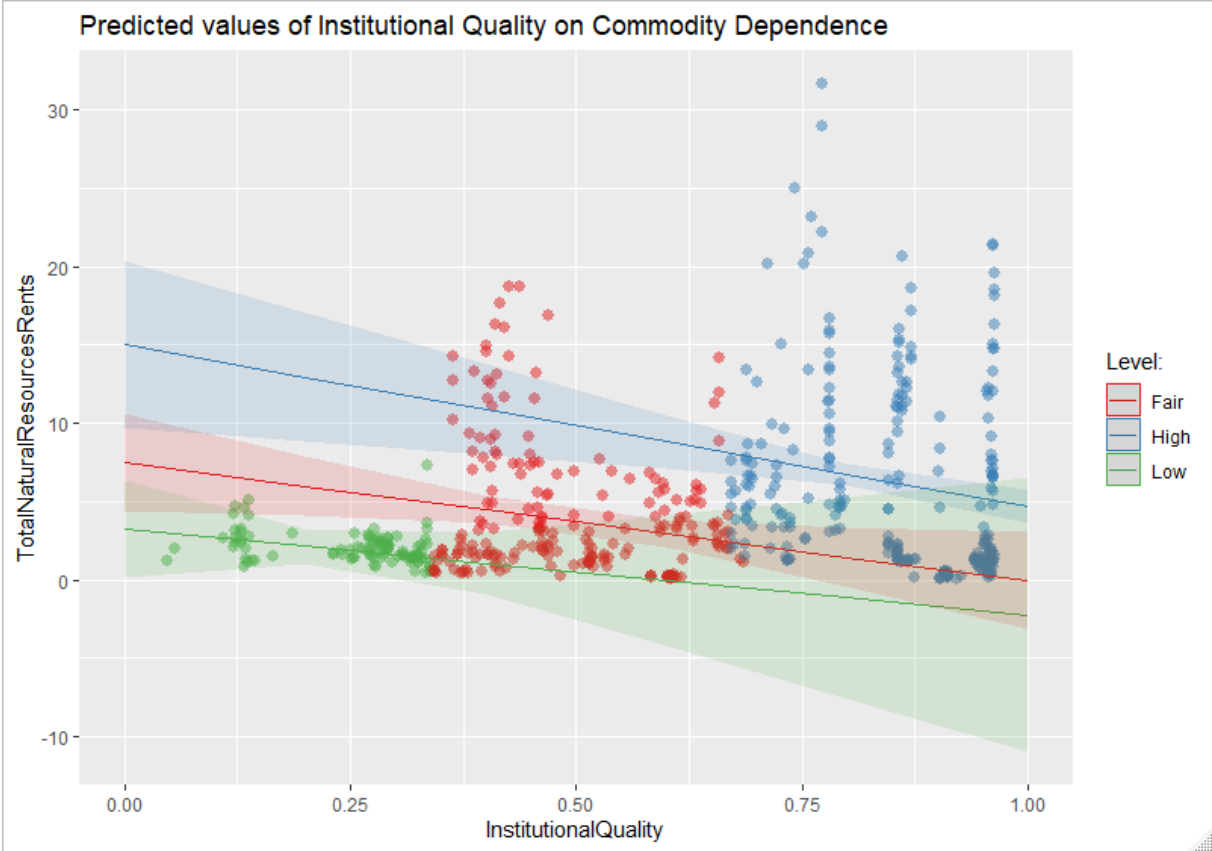
Notes: Total natural resources rents (% of GDP) are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents, weighted average, for 22 Latin American countries, 1990-2019. Missing data imputed by Multivariate imputation by Chained Equations (MICE). Models apply heteroscedasticity-robust (HC3 and HC4) White standard errors, clustered by time. Data are sourced from CEPALSTAT, Penn World Tables, V-Dem, WITS, and World Bank. \*p<0.1; \*\*p<0.05; \*\*\*p<0.01

**Table 4:** RE model w/ White (HC3 and HC4) standard errors, clustered by country. DV: Total natural resources rents (% of GDP).

In agreement with Tables 2 and 3, Commodity exports to China has no significant value. Thus, my findings disprove H1. In contrast, unlike Tables 2-3, capital imports from China is now strongly significant, at the 0.01 level, with a modest positive effect (0.042) and low standard errors (0.016). This indicates that one unit increase in capital import share from China correlates with a decrease in total natural resources rents as % of GDP by 0.042 points. Given that my H2 argues that capital imports lead to an increase in commodity dependence, we can say that Table 4 supports H2. And not surprisingly at this point, Commodity exports to USA is significant at the 0.05 level, with an admittedly low coefficient (0.020) and low standard errors (0.008). This confirms my previous findings (see Tables 2 and 3). Trade Openness is now also significant, at the 0.10 level, with modest positive effect (0.020), and low standard errors (0.012).

Another novel finding is that Tables 2 and 3, Rule of Law is now significant, at the 0.10 level, with a high coefficient (1.595). And its standard errors are low (0.846, 0.839), granting this variable accuracy. Thus, one unit increase in Rule of Law leads to an increase of 1.595 in total natural resources rents. And so, my H5 is supported by Table 4, unlike my other models. And lastly, GDP growth is now significant at the 0.10 level, with a weak positive coefficient (0.083) and low standard errors (0.045). In contrast, GDP per capita growth is now insignificant. This is an interesting find, contrasting the results from Tables 2 and 3. This indicates that every one unit increase in national GDP growth is correlated with a 0.083 point

increase in LAC total natural resources rents. Again, my H6 is both supported and contradicted. This leads us to the model statistics. The observations are 659. The R2 grants the models an explanatory value of 8.3%, while the adjusted R2 gives them a value of 7.3%. Lastly, the F statistic is significant but in comparison to Tables 2 and 3, it has a low score (58.873). Do however remember that the total natural resources rents is highly skewed, which can negatively impact the results of Table 4. Before we move on to discuss the implications of these findings, I will now show you an interaction plot between institutional quality and total natural resources rents.



**Figure 8:** Three-way marginal effects interaction plot of the effect of Institutional Quality on Total Natural Resources Rents as percentage of GDP.

It was implied in the literature section that the presence of strong legal and political institutions was consequential to avoid natural resource wealth becoming a resource curse (e.g. Chile, Norway). Institutional quality is here represented by my Rule of Law variable. We notice that although the data points are fairly scattered, the plot seems to indicate that the more total natural resources rents proportionate to GDP, the lower the institutional quality. This is a startling find, lending support to the existence of a resource curse mechanism.

## 5.5 ROBUSTNESS CHECKS

I will now elaborate on the robustness checks carried out in my analyses. As you know, the purpose of robustness checks is to corroborate the assumptions (i.e. hypotheses) made in my research to advocate my selection of estimators (IVs, CVs and DVs). As robustness checks for my models, I have first employed Hausman test to examine whether FE or RE was ideal for my analysis, in which the former was the most appropriate for one of my models (see Table 3), and the RE was more appropriate for the other (see Table 4). See Appendix C for the Hausman test results. Further, I employed the Breusch-Pagan test to assess whether or not there was heteroscedasticity in my models, in which the results implied heteroscedasticity in both my fixed effects model and my random effects model (see Appendix C).

To control for heteroscedasticity, as well as temporal and spatial correlation, I employed Driscoll-Kraay (FE) and White (RE) standard errors, clustered by country for my fixed effects model and clustered by time for my random effects model. To further strengthen my findings, I utilized two forms of heteroscedasticity-consistent estimators (HC3 and HC4) for both my FE and RE models (see section for the strengths and weaknesses of HC3 and HC4). The purpose was to strengthen the validity of my standard error estimation is correct, and as we can see, they reach similar estimations in all the models. To further bolster my results, I have also tested several forms of DVs representing commodity dependence: 1) dummy variable for commodity exports share, 2) percentage variable for commodity export share as part of total exports, and 3) percentage variable for total natural resources rents as proportion of GDP.

The models in my Tables 2-4 also include an F statistic, the function of which I have explained previously in this section. All my models had highly significant values and high coefficients. And lastly, as I have already covered in the method section, I have included CIs for my variables, which prove that the sample means do not differ much from the population mean (see Appendix C). For the purpose of checking the multicollinearity of my remaining variables, I have generated Variance Inflation Factors (VIFs) for all the variables in my analysis (see Appendix C). The VIFs tell you how much the coefficient errors increase in a variable when all the other variables are included into the model (2021, 118). Further, as you can see, all my variables have low VIF numbers (as a rule of thumb, 10% is generally too high), and we can therefore assume that my analysis is free of multicollinearity (Monogan III 2015, 93). On a similar note, I have also included confidence interval (CI) estimates with 95% reliability in my Appendix C. The CI is considered a “generally accepted standard” which

illustrates how reliable and accurate your research calculations are with regards to reality, with footing in statistical theory.

The CI utilizes a sample from the population to calculate the interval of likely, representative figures of the population. The narrower the CI, the more certain we are that our sample estimates represent the population. Take the example of my GDP per capita growth variable (see Appendix C): the CI tell me that if one was to estimate the results of that variable an indefinite number of times, the amount would fall between 0.02 and 0.03 95% of the time (Institute for Work & Health 2007). Thus, we can be pretty sure that this estimate is correct. When observing the CI for the rest of the variables, we see that they do not vary very much, 5% variability at most, which gives me confidence that my estimates are fairly representative of my populations. In sum, my models have employed considerable robustness checks, which lends credibility to my findings. In the subsequent section, I will discuss the implications of my results, particularly with regards to my theories. In sum: with all these robustness checks, I think we can be pretty sure that my findings are strong.

## **5.6 SUMMARIZING MY FINDINGS**

So then, I have now run three different panel regressions to test my six hypotheses, the results of which have been supported by numerous robustness checks. But what have I found? First of all, trade with China does have a modest effect on Latin American commodity dependence. But the small effect it constitutes might surprise some scholars. In my LPM, Commodity exports to China only partly seem to affect Latin American commodity export share, while Chinese capital imports has a moderate positive effect on LAC total natural resources rents share of GDP. Meanwhile, unlike China, I find that trade with USA is significantly exacerbating LAC commodity dependence at a surprisingly high rate. This could of course simply be a continuation of the historic hegemon of Latin America. In any case, if China is slowly replacing the US influence in Latin America, my findings indicate that this process is very slow. Trade Openness was insignificant on commodity export share, but modestly significant with a weak positive effect on total natural resources rents.

Further, Rule of Law, while insignificant on commodity export share, seems to have a significant value in addition to a strong positive effect on total natural resources rents. And when employing an interaction plot, we find a startling development: that the more natural

resources rents, the poorer the institutional quality. These findings indicate that the solution to Latin American commodity dependence might be found in its institutions. I will talk more about this in the discussion section.

GDP, meanwhile, had differing effects; GDP per capita growth had a strong significant and high positive effect on commodity export share, while having no significant value on total natural resources rents. Meanwhile, national GDP growth had no significant effect on commodity export share, but a modest significant effect on total natural resources rents. It is also important to mention that while my models have a fairly high explanatory value, they have inarguably omitted some key important factors. Naturally this is often the case with social science research, but this obviously indicates that further research would need to be conducted to more properly assess the factors leading to the phenomenon of commodity dependence. I will now move on to discuss how my findings fit with the key theories utilized in this paper: Dependency theory and Neoclassical economics.

## **6 DISCUSSION: DEPENDENCY THEORY VS NEOCLASSICAL ECONOMICS**

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So how do my findings correspond with Dependency theory and Neoclassical economics? In what follows, I will compare the results with the tenets of the two theories. So, as I have mentioned in the theory section, the *Singer-Prebisch theory* argues that the world consists of developed and underdeveloped countries, where the underdeveloped countries export commodities to the developed countries, which use these commodities to produce more advanced products to sell back to the underdeveloped countries at a higher value-added price. The implication is that by this unequal exchange, developed countries rob underdeveloped countries of the profits needed to develop, perpetuating this unequal world system.

This theory is, I would argue mostly supported: although the effect is modest, I find that commodity exports to China does have a small effect on Latin American commodity dependence. But this effect is overshadowed by the effect of commodity exports to the USA, which has a much more significant, higher positive effect on LAC commodity dependence. This regards both commodity export share and total natural resources rents. This would lend support to the Singer-Prebisch theory. But do note that it does not contradict the Neoclassical economics (remember the Comparative Advantage Theory), which argues that a country should emphasize production of that which it has an abundance of (e.g. labour, natural

resources, capital). Admittedly, the CAT argues that a country will develop into a developed country over time, indicating that the reliance on primary sectors is just a temporary situation.

And as I have covered in my theory section, Latin America is abundant in natural resources, which implies that the CAT would encourage that LACs focus on production and trade of natural resources. And remember that according to the CAT, being commodity dependent is not a negative situation for a country when commodities constitute the resource of which it has an abundance. This is because, as they argue, by following this strategy, over time prices of production would over time even out between developing and developed countries, leading developing countries to develop into developed countries. By implication, it seems Neoclassical economics dismisses the negative effects that can result from commodity dependence (deindustrialization, famine, depletion etc) and how hard it seems to escape the vicious cycle it represents (remember figure 2). Arguably, this is not a fair analysis: for me to properly test the validity of the CAT, I would need to investigate the effect of commodity dependence on economic development (which, to be sure, is definitely a goal in the future).

After all, one of the core disagreements between Dependency theory and Neoclassical economics is the *nature* of commodity dependence itself: while Dependency theory argues that commodity dependence is a situation of underdevelopment of which it is difficult to escape, Neoclassical economics argue that commodity dependence is a necessary step for a developing country to becoming a developed country (remember the factor-price equalization). One way in which I could have tested the Neoclassical economics is assessing the effect of trade openness on commodity dependence. Recall how Neoclassical economics argue that by being integrated into the world economy (in my analysis represented by trade openness), a developing country will over time become developed, i.e. diversified and develop its other sectors, reducing its dependency on the commodity sectors.

Moving on, the Dependency theory's Vanek-Reinert effect suggests that importing more advanced products from developed countries disincentivizes local and national manufacturing, and therefore forces the disintegration of the most advanced and capital-intensive industries in these underdeveloped countries, strengthening their dependence on the commodity sectors. And thus, one would assume that capital imports from China exacerbated LAC commodity dependence. And it is true, what I find is that, while again modest, capital imports from China does have positive effect on Latin American total natural resources rents.

This would imply that by importing advanced products from China, Latin American countries increase their reliance on natural resources as a source of national income. Again, this fits with the Dependency theory narrative of foreign advanced imports disincentivizing the production of advanced sectors in LACs. Of course, China is not considered a developed country, but it is one of the strongest economic, military and political powers in the world with global ambitions, and therefore they in many ways resemble a developed country.

In other words, trade with China and USA increase Latin American commodity dependence, demonstrating that, although differing in effect, trading with developed countries increase LAC commodity dependence. This indicates that by trading with developed countries, LACs on average become more commodity dependent. Furthermore, what these results demonstrate is that China has not yet replaced the USA as the dominant trade partner in Latin America. In fact, my results indicate that China has a long way to go to reach that goal (given that it is an objective of theirs). But given that China has made inroads into the continent over the last decades, the future is hard to ascertain.

With regards to the Vanek-Reinert theory again, the positive effect of trade openness on total natural resources rents is also interesting. If trade openness was to lead to decreased commodity dependence, this would indicate that Neoclassical economics was correct. In contrast, Dependency theory argues that by becoming integrated into the global trade, developing countries, which tend to have underdeveloped industry sectors, would experience deindustrialization, leading to an increase in their commodity dependence. In addition, the Dependency theory's theory of unequal exchange, as elaborated upon in the theory section, claims that if exposed to a free competition environment, the profits would relocate from the developing to the developed countries.

This is because developing countries often export products from lower-wage sectors, and therefore their products are cheaper than the products from the developed countries. In other words: while Neoclassical economics argue strongly in favour of developing countries being included into the world economy, Dependency theorists strongly advise against it. While trade openness has no significant effect in the other models, the positive effect of trade openness on total natural resources rents indicates that being integrated into the world markets increases LAC dependence on the primary sector for economic growth. Therefore, this supports the Dependency theory. But to be sure, it does not completely discredit the comparative



advantage theory, as it argues that commodity dependence is just a step on the way to development. Now, do keep in mind that my analysis has not factored in all aspects of the Sino-Latin American trade relationship. I have only included imports of advanced products and exports of primary products.

For a full picture, I should have included all imports and exports of all export classes, where one way to do it would be to include the four trade goods classes defined by the WITS (i.e. primary, consumer, intermediate and capital). And indeed, trade is not the only economic activity that China engages in on the continent: over the years we have seen an increase in Chinese FDI, loans, aid, engineering and construction projects in Latin America. Further, I cannot state enough how much LACs differ in economic output (remember my previous comparison between the GDP of Dominica and Brazil in 2020). Thus, since my analysis has provided one aspect of this nuanced relationship, you should remember that there is a lot more to the story of Chinese economic influence in Latin America. In any case, my results support Dependency theory so far. However, again, this is not to say that Neoclassical Economics is dismissed.

Moving on, we see that while national GDP growth does not have any significant effects on commodity export share, it does have a slight positive effect on total natural resources rents. Meanwhile, GD per capita growth has a strong significant and very high positive effect on commodity export share, but not on natural resources rents. Both these examples would lend support to the Dependency theory claim that commodity-dependent developing countries find themselves in a vicious cycle where they invest their profits to expand their primary sectors, making them even more commodity dependent. And one could argue that this disputes the Neoclassical claim that emphasizing production on commodities would lead to factor-price equalization, which in turn over time would let developing countries diversify and become developed countries. However, on the other hand, as they argue that this development would occur over time, it is hard to account for this theory on the limited 30-year time period analyzed in this paper. In any case, this finding indicates that GDP growth (national and per capita) causes a ‘commodification’ effect of the economy. But again, while Dependency theory argues that this commodification is a negative development, Neoclassical CAT argues the opposite if the country has an abundance of commodities.

Another interesting finding is that, while Rule of Law has no significant effect on LAC commodity export share, it does have a strongly significant and high positive effect on total natural resources rents. This indicates that increased institutional quality is associated with increased share of natural resources profits. However, whether this represents a positive (e.g. Chile, Norway) or a negative (e.g. Argentina, Venezuela) development, may depend on the macroeconomic policies employed by the individual countries. Again, in this analysis I have only provided (a fraction of) the first part of the discussion, namely what *leads* to commodity dependence. But what is just as important, if not even more, is which effect commodity dependence has on a society. Perhaps most vital is the relationship between commodity dependence and economic development.

Thus, it is hard to state whether this finding confirms or rejects the Dependency theory, in that increased natural resources rents proportion of GDP could lead to a resource curse or these profits being spent on sound macroeconomic policies (e.g. diversifying the economy). But the interaction plot (see Table 5) seems to indicate that the more the natural resources, the lower the institutional quality. Which seems to indicate a resource curse mechanism. Personally, I believe more scrutiny would need to be made with regards to the effect of proper institutions on natural resource management. After all, this seems to be implied as an important factor in the literature with regards to commodity dependence. In addition, all my models have modest R2 levels (i.e. explanatory values). This indicates that my analysis has omitted important variables that could aid in filling the picture. This is of course a natural situation in social science research. But nevertheless, it does indicate that further research would need to be made on this field in the attempt to discover some other important factors leading to and resulting from commodity dependence.

On a final note, before I move to the conclusion: the analytical choices made in this analysis was by no means the only way to research this subject. For instance, I have only investigated the effect of one economic activity China is involved with in Latin America. Although this was largely a consequence of the predominant importance given to it in the academic literature (Jenkins 2019, 224), it would certainly be interesting to inspect the effects of other Chinese economic activities on Latin American commodity dependence, such as FDI, loans, aid, engineering and construction projects (2019), as they would aid in demonstrating the full effect of China on LAC commodity dependence. Additionally, it would undeniably have been of eminent value to include an analysis on the effect of commodity dependence on economic

development. Not just for the sake of creating a better portrayal of the nature of commodity dependence, but also to contribute to the discussion on whether or not the Dependency theory or the Neoclassical economics and the comparative advantage theory are viable economic theories.

Further, I chose to measure commodity dependence with emphasis on trade with China and commodity export share and total natural resources rents share of GDP. However, there are other ways to operationalize commodity dependence, one example being utilizing the Herfindahl-Hirschman Index. Moreover, I could have included an analysis of how trade with China affects industrialization, not necessarily only in Latin America, but maybe as a comparative study between Africa and Latin America, both continents where China has considerably increased its presence over the last decades. Hopefully I will have a chance to carry out this research in the future.

## **7 CONCLUSION**

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In this text I have conducted a three-section panel data regression analysis to assess the effect of trade with China on Latin American commodity dependence between 1990 and 2019. My research has been based primarily on Dependency theory, with Neoclassical economics as a counternarrative. My findings seem to support Dependency theory in a couple of ways. First of all, trade with more developed countries (in this case China and USA) does increase the commodity dependence of developing countries (i.e. Latin American countries). Admittedly, when compared with the effect of trade with the USA, China still has a long way to go if it intends to replace the traditional hegemon in the region. Secondly, there are indications that trade openness exacerbates commodity dependence by increasing natural resources rents share of GDP. And third, I find signs that domestic institutions might play a key role in mitigating commodity dependence. However, my findings illustrate the need for further research on what leads to, and the consequences of commodity dependence, as it has been increasing worldwide over the last 20 years. I repeat the Coke-Hamilton quote from the first page of this thesis: commodity dependence might not make the headlines, but its effects do.

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Data and variables:

***Exports of primary products as a share of total exports (Percentages of the total value of f.o.b. exports of goods)***

Includes all the products in the following sections: 0. Food and live animals chiefly for food; 1. Beverages and tobacco; 2. Crude materials, non-edible, except fuels; 3. Mineral fuels, lubricants and related materials; 4. Animal and vegetable oils, fats and waxes; 9. Commodities and transactions not classified elsewhere in the SITC. Division 68 – non-ferrous metals – is also included. Source: ECLACSTAT.

***Exports product share raw materials to China in %***

Covers unprocessed products, including meats (e.g. squid, poultry, lamb, fish), vegetables (e.g. potatoes, mushrooms, cucumbers), fruits (e.g. grapefruits, oranges, grapes, mandarins), metals (e.g. titanium ores, tin ores, molybdenum ores, precious metal ores). Source: WITS.

***Exports product share raw materials to USA in %***

The same definition as the variable above. Source: WITS.

***GDP growth (annual %)***

Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. GDP is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Weighted average. Source: World Bank.

***GDP per capita growth (Penn World Tables)***

This estimate is sourced from Penn World Tables version 9.1. This variable is calculated by dividing their *Output-side real GDP at chained PPPs (in il. 2011US\$)(rgdpo)* variable on their *Population(Pop)* variable, then subtracting the GDP per capita for the previous year on the GDP per capita for the present year, then multiplying by 100 and dividing by the growth rate for the previous year. I summarize the formula below:

$$\text{GDP PPPs}(t-1) / \text{Pop} - \text{GDP per capita}(t0) \times 100 / \text{GDP growth rate}(t-1).$$

***Imports product share capital goods from China in %***

Covers (mostly) processed products, including power looms, paintings and pastels, and purebred breeding animals. Source: WITS.

***Rule of Law Index***

The index is formed by taking the point estimates from a Bayesian factor analysis model of the indicators for compliance with high court, compliance with judiciary, high court independence, lower court independence, executive respects constitution, rigorous and impartial public administration, transparent laws with predictable enforcement, access to justice for men, access to justice for women, judicial accountability, judicial corruption decision, public sector corrupt exchanges, public sector theft, executive bribery and corrupt exchanges, executive embezzlement and theft. This measure is estimated in an interval from low (0) to high (1). Source: V-Dem Standard Dataset Version 12.

***Total natural resources rents (% of GDP)***

Total natural resources rents are the annual sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Weighted average. Source: World Bank.

***Trade Openness (% of GDP)***

Trade Openness is measured as the sum of a country's exports and imports as a share of that country's GDP (in %). Source: Penn World Tables.

**R packages:**

Croissant, Yves, Giovanni Millo, Kevin Tappe, Ott Toomet, Christian Kleiber, Achim Zeileis, Arne Henningsen, Liviu Andronic, Nina Schoenfelder (2022). Plm: Linear Models for Panel Data. R package version 2.6-1. <https://cran.r-project.org/web/packages/plm/index.html>.

Van Buuren, Stef, Karin Groothuis-Oudshoorn, Gerko Vink, Rianne Schouten, Alexander Robitzsch, Patrick Rockenschaub, Lisa Doove, Shahab Jolani, Margarita Moreno-Betancur, Ian White, Philipp Gaffert, Florian Meinfelder, Bernie Gray, Vincent Arel-Bundock, Mingyang Cai, Thom Volker,

Edoardo Constantini, Caspar van Lissa. (2021). mice: Multivariate Imputation by Chained Equations. R package 3.14.0. <https://cran.r-project.org/web/packages/mice/index.html>.

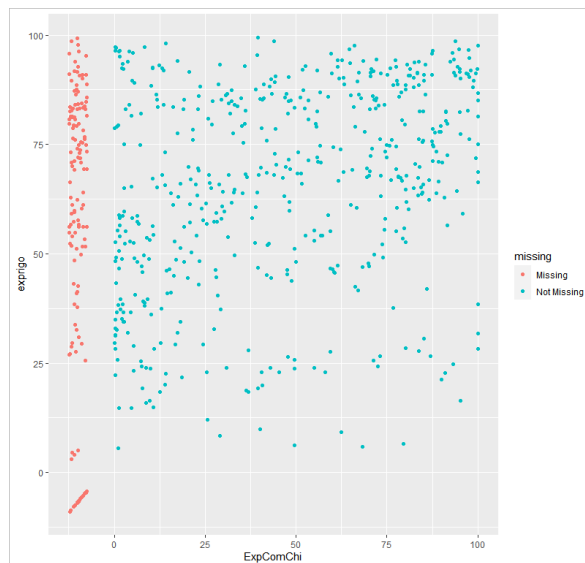
Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller. (2022). dplyr: A Grammar of Data Manipulation. R package version 1.0.9. <https://cran.r-project.org/web/packages/dplyr/index.html>.

Wickham, Hadley, Winston Chang, Lionel Henry, Thomas Lin Pedersen, Kohske Takahashi, Claus Wilke, Kara Woo, Hiroaki Yutani, Dewey Dunnington. (2022). ggplot : Create Elegant Data Visualisations Using the Grammar of Graphics. R package 3.3.6. <https://cran.r-project.org/web/packages/ggplot2/index.html>.

Zeileis, Achim, Thomas Lumley, Nathaniel Graham, Susanne Koell (2022). sandwich: Robust Covariance Matrix Estimators. R package 3.0-2. <https://cran.r-project.org/web/packages/sandwich/index.html>.

**Percent of missingness on central variables**

Exports of primary goods as share of total exports in %	Trade Openness (%)	Imports capital goods from China (%)	Exports product share raw materials to China in %	Exports product share raw materials to USA in %	GDP growth (annual, %)	GDP per capita growth in %	Imports of primary goods as share of total imports in %
2.57	6.66	17.72	21.21	11.06	0.00	6.66	17.42
<b>Rule of Law</b>							
9.09							



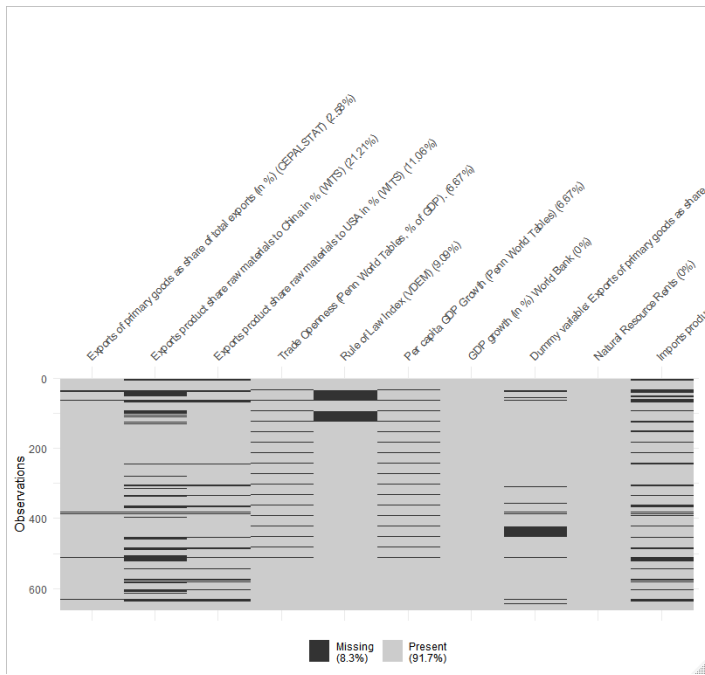
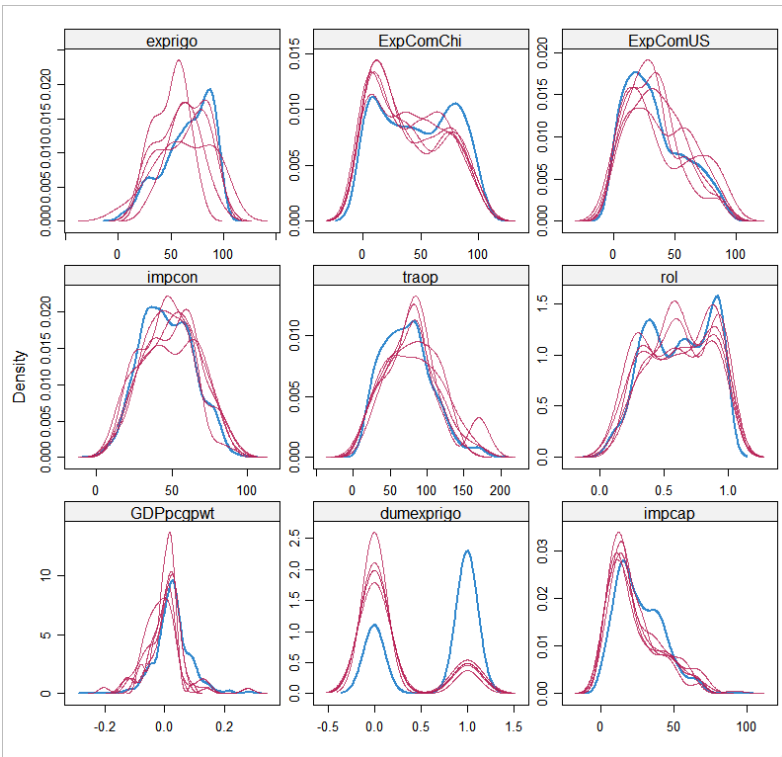
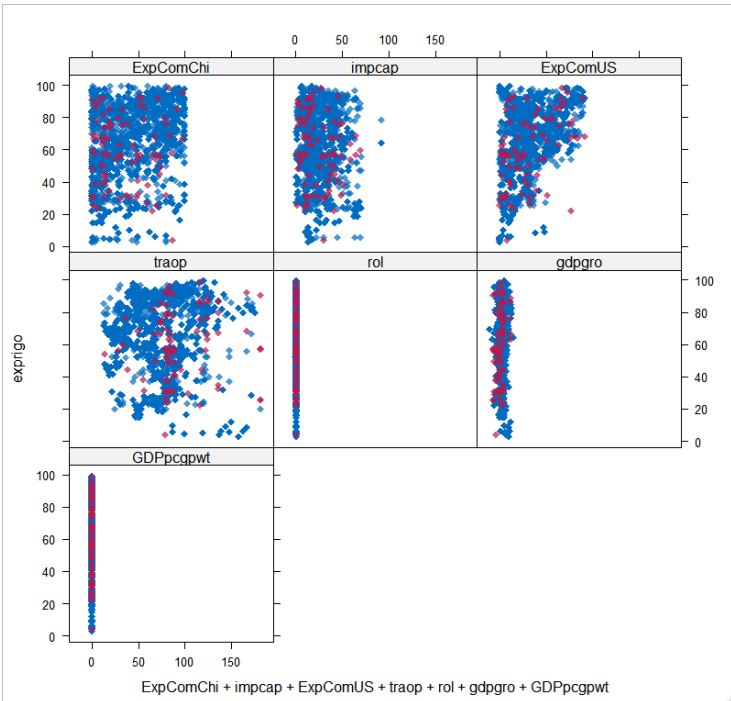
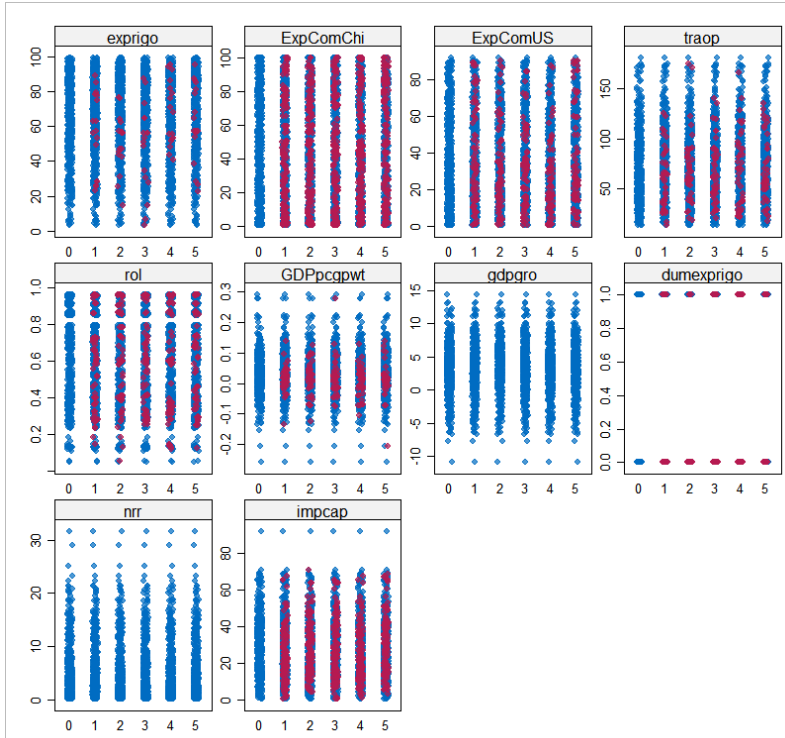


Figure 9: Missingness plot all variables

**Imputation Plots:**



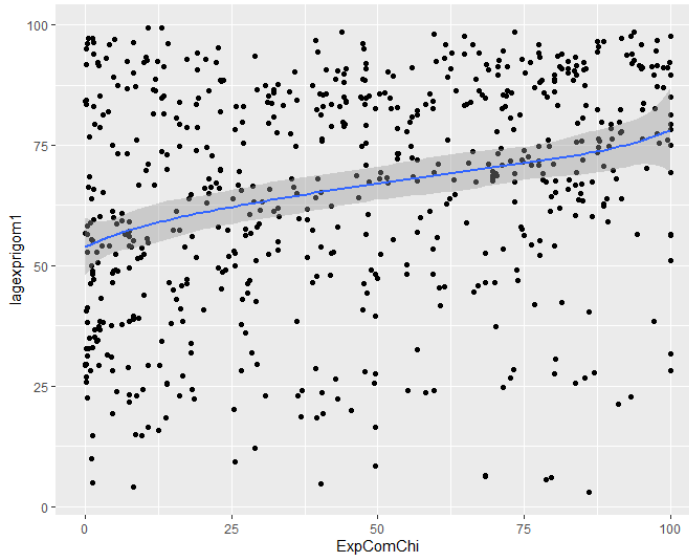




**10 APPENDIX B**

**Distributions on variables**

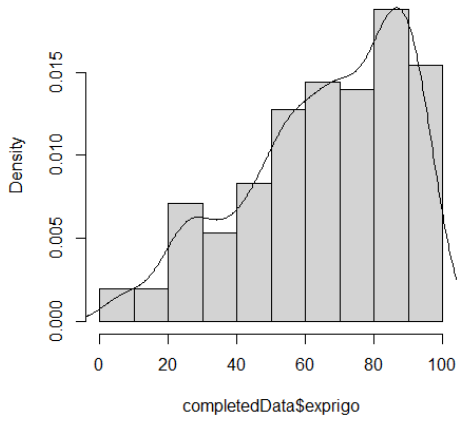
Scatterplot: dependent (lagexprigom1) ~ independent variable (expriego)



**Density Plots**

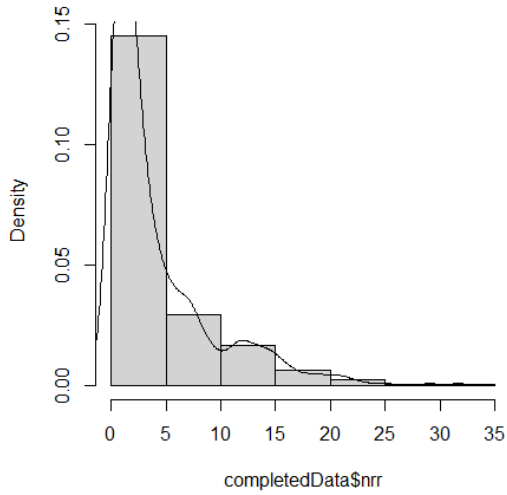
Density plot for variable: *commodity exports share of total exports:*

Histogram of completedData\$exprigo



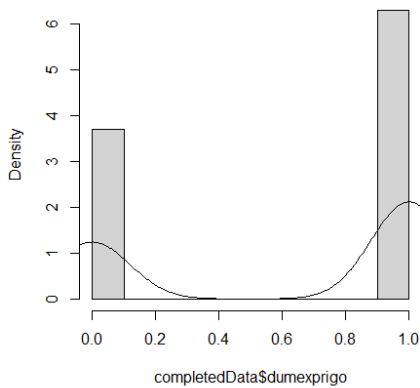
Density plot for variable: *Total natural resources rents (% of GDP)*:

Histogram of completedData\$nrr



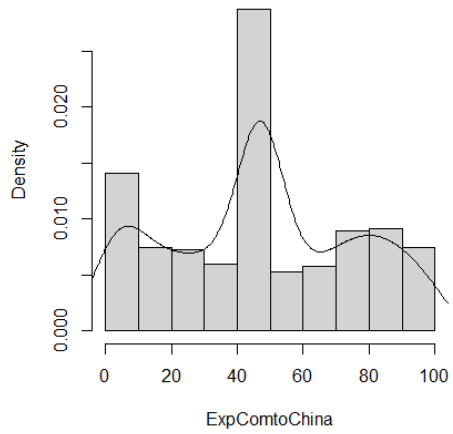
Density plot for variable: *commodity exports share of total exports (binary)*:

Histogram of completedData\$dumexprigo



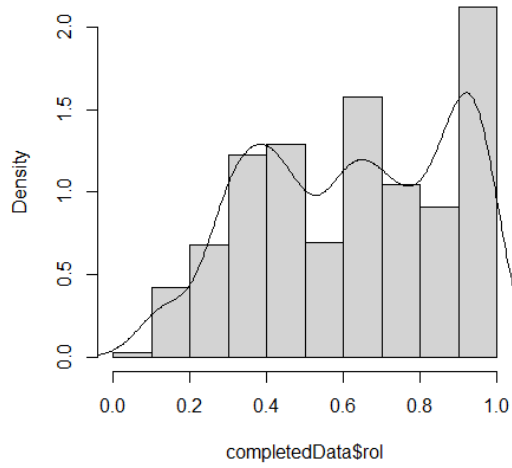
Density plot for variable: *export commodity share to China*

**Histogram of ExpComtoChina**

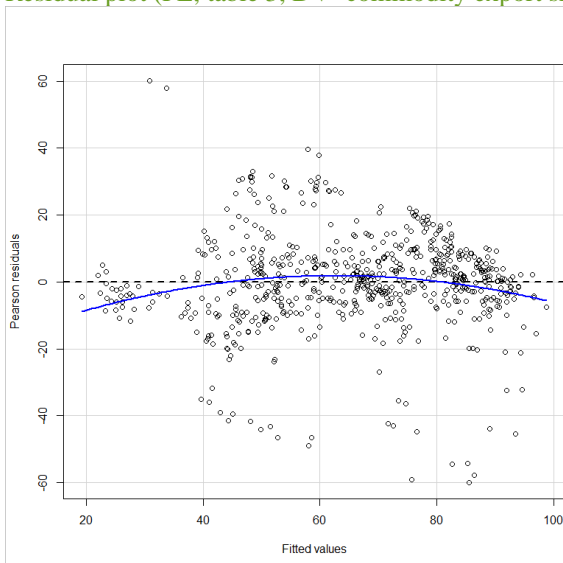


Density plot for variable: *Rule of Law*:

**Histogram of completedData\$rol**



**Residual plot (FE, table 3, DV=commodity export share)**



**TABLE 4 - Studentized Breusch-Pagan Test against Heteroscedasticity**

Model:	Commodity export share (% of total exports), t-1 ~ Commodity export share to China + Capital import share from China (% of total imports) + Commodity export share to USA (% of total exports to USA) + Trade Openness (%) + Rule of Law Index + National GDP growth (%) + GDP per capita growth (%)
BP estimate=	43.804
Df =	7
p-value	0.000

**TABLE 5 - Hausman Test for Panel Models**

Data:	Commodity export share (% of total exports), t-1 ~ Commodity export share to China
Model:	Random effect MODEL2, Fixed effects MODEL2
Chisq:	16.993
Df:	7
p-value=	0.01

**TABLE 6 - Studentized Breusch-Pagan Test against Heteroscedasticity**

Model:	Total natural resources rents (% of GDP), t-1 ~ Commodity export share to China + Capital import share from China (% of total imports) + Commodity export share to USA (% of total exports to USA) + Trade Openness (%) + Rule of Law Index + National GDP growth (%) + GDP per capita growth (%)
BP estimate=	43.804
Df =	7
p-value	0.000

**TABLE 7 - Hausman Test for Panel Models**

Data:	Total natural resources rents (% of GDP), t-1 ~ Commodity export share to China
Model:	Random effect MODEL2, Fixed effects MODEL2
Chisq:	3.67
Df:	7
p-value=	0.81

**Table 8 - VIF: Variance Inflation Factor: Variation inflation factors of all predictors**

Commodity export to China (%)	Commodity exports to USA (%)	National GDP growth (%) (World Bank)	GDP per capita growth (%) (Penn World Tables)	Capital imports from China (% of total imports)
1.179211	1.261799	1.573031	1.538304	1.183333
Rule of Law Index	Trade openness (%)			
1.111576	1.127736			

**Table 10 – Confidence Intervals**

Variables	2.5%	97.5%
Commodity exports to China (%)	44.36	49.82
Commodity exports to USA (%)	31.55	35.45
National GDP growth (%) (World	2.90	3.40

Bank)		
GDP per capita growth (%) (Penn World Tables)	0.02	0.03
Total Natural Resources Rents (% of GDP) (World Bank)	3.81	4.57
Rule of Law Index	0.60	0.64
Commodity export share (% of total exports)	63.97	67.55
Trade openness (%)	70.37	75.67
Capital imports from China (% of total imports) (WITS)	25.36	28.01

**TABLE 11 – Skewness**

Skewness	-0.5005751
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**TABLE 12 – Kurtosis**

Kurtosis	3.614119
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