

# Bullion and Monetary Flows in the Northern Andes: New Evidence and Insights, 1780-1800

**Flujos de monedas y metales en los Andes Septentrionales:  
nuevas evidencias y perspectivas, 1780-1800**

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## ABSTRACT

The paper examines the direction, magnitude and dynamics of bullion and monetary flows in the Viceroyalty of New Granada (present-day Colombia and Ecuador), the largest gold producer of the Spanish empire, during the late colonial period. The paper interweaves notarial records and little-explored post office accounts to craft a preliminary, yet novel, monetary geography of the region. It identifies the cities and regions that agglomerated the flows of gold and silver in the form of bullion and coins. The paper pursues a mostly empirical goal. It seeks to provide materials and insights to further study the mechanics of bimetallism in the region. The article suggests that bullion markets had a broader scope across distant regions



than previously thought. The paper, then, supports the claim of recent scholars who have studied the flow of consumer goods in showing that the Northern Andes were much more integrated. Therefore, it is necessary to abandon the present-day national borders framework to analyze the north Andean economies.

**Keywords:** Bimetallism, Northern Andes, Networks, Monetary History, Bullion, Money, Economic History

**JEL Codes:** E49, E69, F54

## RESUMEN

Este artículo examina la dirección, la magnitud y la dinámica de los flujos monetarios y de lingotes en el Virreinato de Nueva Granada (actualmente Colombia y Ecuador), el mayor productor de oro del imperio español durante el período colonial tardío. El artículo entrelaza registros notariales y cuentas de las oficinas de correos poco exploradas, para elaborar una geografía monetaria preliminar pero novedosa de la región. Identifica también las ciudades y regiones que aglomeraron los flujos de oro y plata en forma de lingotes y monedas. Este artículo tiene un objetivo mayormente empírico: busca proporcionar materiales y perspectivas para estudiar más a fondo la mecánica del bimetallismo en la región. El artículo sugiere que los mercados de lingotes alcanzaron a llegar a regiones más distantes de las que se pensaba anteriormente, y por consiguiente, apoya la afirmación de académicos jóvenes que han estudiado el flujo de bienes demostrando que los Andes septentrionales estaban mucho más integrados. Por lo tanto, es necesario abandonar el marco actual de las fronteras nacionales para analizar las economías de los Andes septentrionales.

**Palabras clave:** Bimetallismo, Andes septentrionales, Redes, Historia Monetaria, Lingotes, Dinero, historia económica

**Códigos JEL:** E49, E69, F54

Mining played a crucial role in the economy of colonial Latin America. It shaped the fiscal and monetary systems, the balance of payments and the aggregate demand through backward and forward linkages across the region. It is not surprising that colonial mining has long been a central concern of economic historians.<sup>1</sup> Yet, two important issues have not been properly addressed. First, the role of gold mining in the context of a bimetallic world. In fact, scholars have overwhelmingly privileged the analysis of silver-driven regions of the continent. Second, the connection between bullion production and monetary history. Some scholars have sustained that the colonial economy was a non-monetized set of subsistence and barter economies. As a consequence, an important puzzle has endured: The regions that fueled world trade with their precious metals suffered from a permanent scarcity of specie. Why, then, have these two gaps persisted in the literature?

The silver-centered character of the literature is explained by three facts. First, during the entire colonial era (1492-1810), silver output by weight was fifty times that of gold (Tepaske, 2010, p. 16). The latter constituted just 2% of the total output of precious metals in physical terms. Second, the fiscal structure of the Spanish empire was sustained by the revenues from the two big silver producers: Mexico and Peru. Some historians even coined the term “sub metropolis” to understand how these two regions fueled the fiscal presence of the Empire in the Caribbean and the Pacific (Marichal, 2007). Finally, scholars have emphasized the international demand-side of mining booms. Since China and India, the biggest economies in the early-modern world, operated under a silver standard, the production and circulation of the gray metal shaped global trade (Flynn & Giráldez, 2002; Tutino, 2011). Though persuasive, these three facts should be put in a broader context. In terms of purchasing power, gold accounted for almost 25% of precious metals output during the entire colonial era (Tepaske, 2010, p. 16). In the eighteenth century, the yellow metal share of total purchasing power fluctuated between 25 and 45%. Naturally, these shares should not lead us to the problem of confusing size with significance. Even in small amounts, gold played a vital role in Atlantic and Pacific trade simply because most of the economies in the Americas worked under a bimetallic system. In a broader sense, colonial Latin America operated under the antecedents of what Marc Flandreau (2003) rightly calls “international bimetallicism”, a system in which bullion flows across three blocs (silver, gold and bimetallic) regulated international and domestic trade.

Under bimetallicism, the government makes a commitment to buy either gold or silver at fixed prices in money designated as legal tender (Friedman, 1990, pp. 85-86). When the market price ratio differed substantially from the legal ratio, arbitrage transactions and bullion flows could take place if transactions costs are low and the relative quantities of both metals is adequate. The mechanics of bimetallicism are the subject of one of the most fascinating debates in economic history (Friedman, 1990; Redish, 2000; Velde & Weber, 2000; Flandreau, 2002; 2003; Nogues-Marco, 2011; 2013). These debates, however, have remained virtually absent in the discussion of colonial mining and monetary history. Peter Bakewell (1971) and Harry Cross (1983) emphasized that the relative price of gold and silver should be included among the variables in explaining the performance of mining. Cross, in particular, stated that “although the official bimetallic ratio within the Spanish empire did not take into account the difference in

1 The literature is extensive. For a preliminary introduction to the field see West (1951; 1952), Brading (1971), Brading and Cross 1972, Bakewell (1984), Coatsworth (1986), Garner (1988), Sánchez (2002), Tandeter (2005), Tepaske (2010), Carrara (2012), Hausberger & Ibarra (2014), Dobado and Marrero (2014).



market values, there nevertheless occurred a flow of specie from a region abundant in silver to one with a demand for it" (1983, p. 401). Few historians followed Cross in studying the role of bullion flows in intercolonial trade. An important exception is the work of recent scholars who have studied the mechanics of bimetallism in colonial Brazil, a gold-rich economy (Cerqueira-Lima, 2013). Even though these studies relied upon qualitative sources, they shed light on the intercolonial nature of bullion flows. In silver-rich economies such as Mexico, the focus has been monometallic. Recent studies of Mexican gold has focused on smuggling and illegal trade (Flores, 2014). However, there is no agreement even on the fundamentals of gold trade such as its mint price, mint equivalent, and market price. In short, scholars have addressed gold and silver as separate worlds.

The second trend in the literature on precious metals, that is, the lack of systemic studies on colonial monetary history, is the result of an enduring viewpoint. Scholars have echoed the frequent complaints of contemporaries about the endemic scarcity of specie caused by a continuous external drain. Ruggiero Romano (2004), perhaps the most important exponent of this position, asserts that a huge demand for imports caused a "bleeding" (*Sangría*) of precious metals that left colonial economies without the specie needed to undertake trade. The supporters of this tradition bring evidence on three aspects: 1) The negligible issuance of low-denomination coins. 2) The stagnant trend of price levels and 3) The non-registered bullion exports that allegedly made the deficit in the balance-of-payment worse. In short, the inhabitants of the colonies resorted to a ubiquitous use of barter, wages were paid rarely in specie and the "tyranny of distance" precluded the development of regional markets. In Romano's argument, merchants consciously excluded natives, mestizos and poor whites from the monetary economy in order to impose unfavorable terms of trade and enhance political dominance. Jorge Gelman, one of Romano's supporters, stated that "merchants were the agents of the demonetization of the Latin-American economy" (Gelman, 1987, p. 505).

Carlos Assadourian (1979; 1982) challenged theoretically and empirically this widely accepted hypothesis. He showed how the forward and backward linkages of mining integrated supply regions and nurtured a market-oriented society. There are two aspects of his argument that deserve further discussing. First, before exported, precious metals lubricated domestic and interregional trade across the colonial system. Second, the colonial economy absorbed important quantities of the bullion production. Assadourian amalgamated these premises with Irvin Fisher's well-known monetary identity to show how general and relative prices were affected by bullion markets. Most Assadourian's students, however, focused subsequently on internal commodity flows and left out the monetary side of the analysis (Jumar, 2014). Kris Lane (1996), Antonio Ibarra (1999a; 199b) and Angelo Carrara (2007) are three salient exceptions. They showed how bullion and monetary flows affected relative prices and fueled the wheels of trade in Guadalajara (New Spain), southern Ecuador and Minas Gerais (Brazil). Recently, scholars (Cerqueira-Lima & Martins, 2016) have joined Carrara in a more quantitative approach to show how gold coinage nourished the expansion of a monetary economy in eighteenth-century Brazil.

Recent literature rejects the hypothesis on shortage of specie on two additional levels. First Gresham's law has been brought to the fore. Following Angela Redish's analysis of Canadian currency, some scholars sustain that colonial economies suffered from a lack of quality rather than quantity of specie (Redish, 1984). This argument has not only been applied to the me-

chanics of Gresham's law in terms of the bullion content of coins with the same face value but also in terms of the mint and market ratios of gold and silver (Irigoin, 2009; Torres, 2013; Cerqueira-Lima, 2013). On a second level, scholars have used the quantitative theory of money (Torres, 2013; 2016). This literature sustains that had these economies suffered from a continuous scarcity of specie, *ceteris paribus*, deflation, and high interest rates would have been pervasive as well. New time series of price levels, interest rates and GDP growth show that the scarcity hypothesis does not hold for some regions. In short, the traditional hypothesis of a non-monetized economy has been under attack. Yet, it is still widely accepted by scholars and the debate remains open.

This paper engages these ongoing debates by examining the direction, magnitude and dynamics of bullion and monetary flows in the Viceroyalty of New Granada (present-day Colombia and Ecuador), the largest gold producer of the Spanish empire, during the late colonial period. The paper interweaves notarial records and little-explored post office accounts to craft a preliminary, yet, novel monetary geography of the region. It identifies the cities and regions that agglomerated the flows of gold and silver in the form of bullion and coins. In a similar vein to Flandreau et al (2009), the paper pursues a mostly empirical goal. It seeks to provide material for a better understanding of the mechanics of bimetallism in the region. A subsequent article will explain the streams unearthed in this paper by exploring what Flandreau (2003) calls the two levelers of bimetallism: arbitrage transactions and the monetary settlements of interregional trade balances.

If an analysis of bimetallism should study intercity arbitrated parities (the ratio of the price of specie in two centers within the same jurisdiction), bullion prices and transactions costs, an attempt to craft a monetary geography should focus on networks and interactions. Accordingly, this paper will harness basic tools from network analysis and visualization to shed light on issues that will be relevant for the analysis of bimetallism. Even though additional research is required, the evidence suggests that bullion markets had a broader scope across distant regions than previously thought. The paper, then, supports the claim of recent scholars who have studied the flow of goods in showing that the Northern Andes were much more integrated. Therefore, it is necessary to abandon the present-day national borders framework to analyze the north Andean economies. In addition to this general remark, the article makes three contributions.

First, the paper suggests that a thick, multilateral network of bullion and monetary flows existed in the northern Andes. The multilateral nature of bullion flows implies that both gold and silver oiled domestic trade by encouraging the monetary settlement of interregional trade balances. The evidence contradicts the old perspective that underlined the enclave nature of bullion production. This is revealing in the case of gold coins whose monetary role has been traditionally confined to international trade.

Second, the paper finds that the region developed a huge bimetallic network that connected the northern Andes with the silver-based economies of the south Andes. Peruvian silver flowed northwards and New Granadian gold southwards. Quito merchants acted as the middlemen. Lima was one of the most important sink nodes of north Andean gold. In other words, Cartagena was not the only port through which the yellow metal produced in New Granada found its way to international markets. North Andean markets, on the other hand, became



sink nodes of Peruvian silver. Even though the evidence is scarce, the paper suggests that Maracaibo also acted as a bimetallic market that released New Granadian gold towards international markets and Mexican silver towards the core of the northern Andes. This network deserves further research.

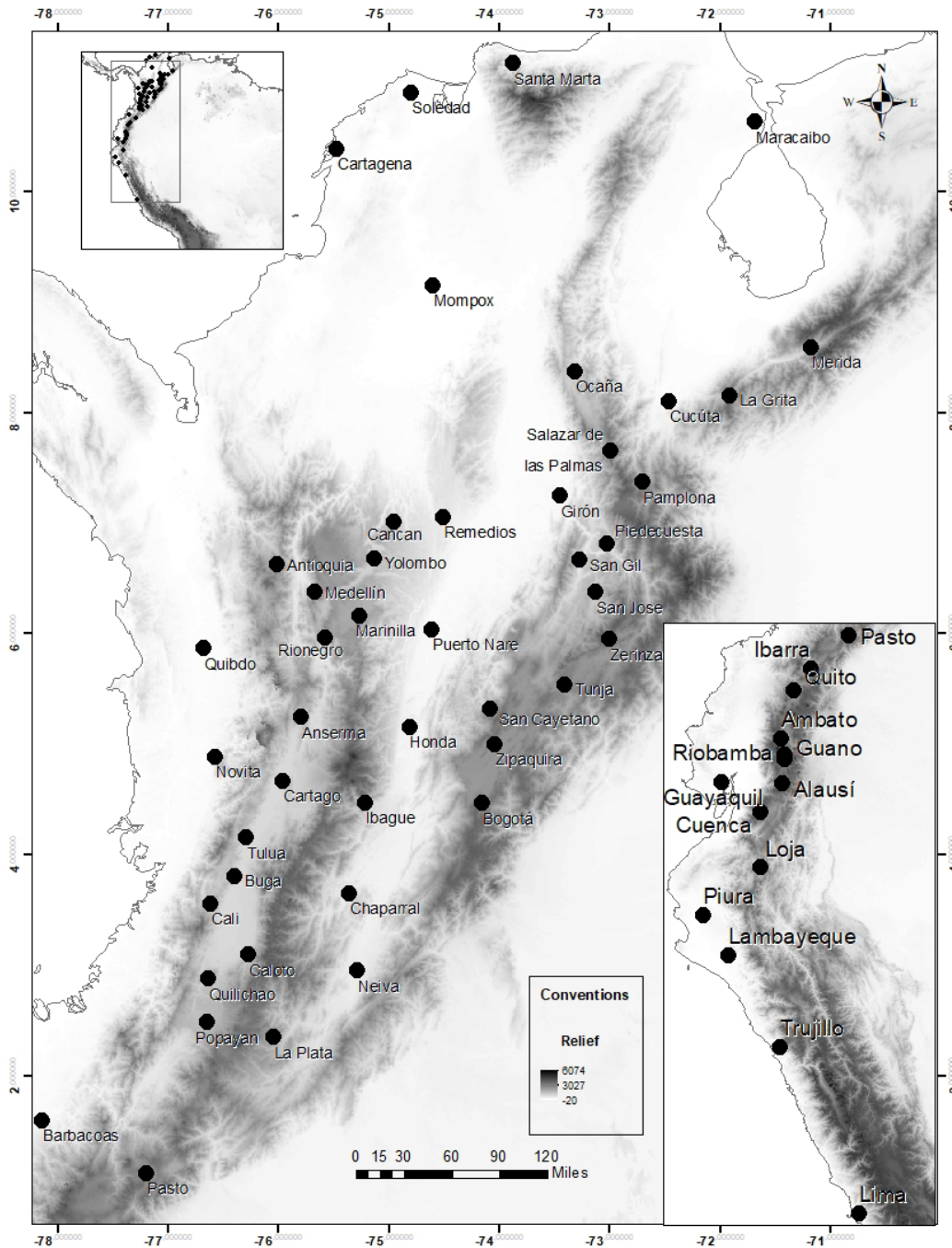
Third, the paper identifies regions in which clusters of bullion and monetary circulation were particularly important. Mining regions, for instance, were avid importers of bullion in the form of coins. The evidence suggests that miners and bullion merchants participated actively in the exchange of bullion for coins. In other words, the well-known *rescate* (exchange of bullion for goods and inputs) was not the only mechanism of exchange inside mining regions. Some non-mining regions such as the Cauca Valley in south west New Granada and the Guayas Basin in coastal Quito also participated actively in the streams of gold and silver. The data suggests that a monetization process accompanied the economic expansion that these regions were experiencing during the late colonial period.

The article proceeds as follows. The next two sections provide an overview of the economic and monetary history of the northern Andes. These sections seek to provide inputs for those readers not informed on the history of the region. Readers versed on the north Andean economic history will find this synthesis refreshing since it harnesses insights from recent literature. The following two sections discuss the evidence on bullion flows from two different sources. Finally, it concludes.

## **The economy of New Granada in the late colonial period: An island of gold in a sea of silver**

The northern Andes lie between the Gulf of Guayaquil and the Venezuelan coastal ranges and encompasses present-day Colombia, Ecuador and western Venezuela (See map 1). This region diverges from the southcentral portion of the Andes (present-day Peru and Bolivia) in several aspects, three of which deserve mentioning. First, the metallogeny of the Northern Andes endowed the region with important gold belts that were very different from the poly-metallic, tin-silver belts of Bolivia and Peru (Sillitoe, 2008, pp. 672-673). In other words, the region was rich in gold but poor in silver. Second, the northern Andes are warmer and lack the high steppe (*puna*) ecosystems that characterized the southern portion of the system. Therefore, the mechanics of verticality in the north were different. For instance, northern societies did not develop camelid-raising complexes in the highlands. In the same vein, northern mines were located at altitudes well below the expected tree-line in sharp contrast to the southcentral mines which were located high in the mountains, in regions short of biomass. Finally, the northern Andes consists of a long, narrow plateau running from south to north bordered by two mountain chains containing numerous volcanoes. In the Pasto's knot and the Colombian massif (nearby the present-day border between Colombia and Ecuador) the Andes split into three branches divided by the fast-flowing Cauca and Magdalena rivers. The latter connected the interior of the colony with ports in the Caribbean. No other region in the Spanish empire was endowed with such an inland connection.

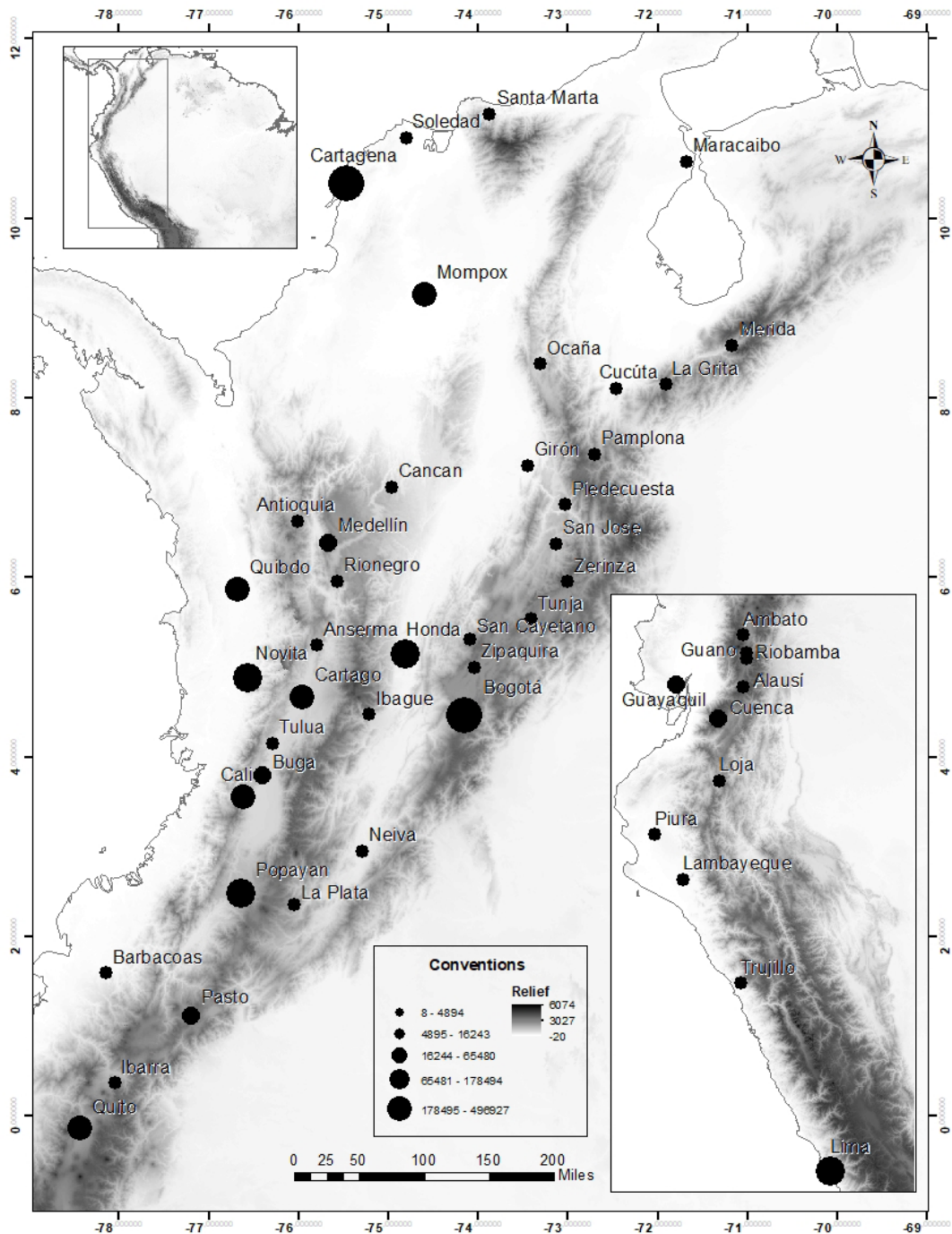
**Map 1. The Northern Andes and nodes analyzed in this paper. \*Lima, Trujillo, Lambayeque and Piura belong to the Peruvian Andes. \*\* I have kept the colonial spelling of the names of some of the nodes.**



Source: See text.



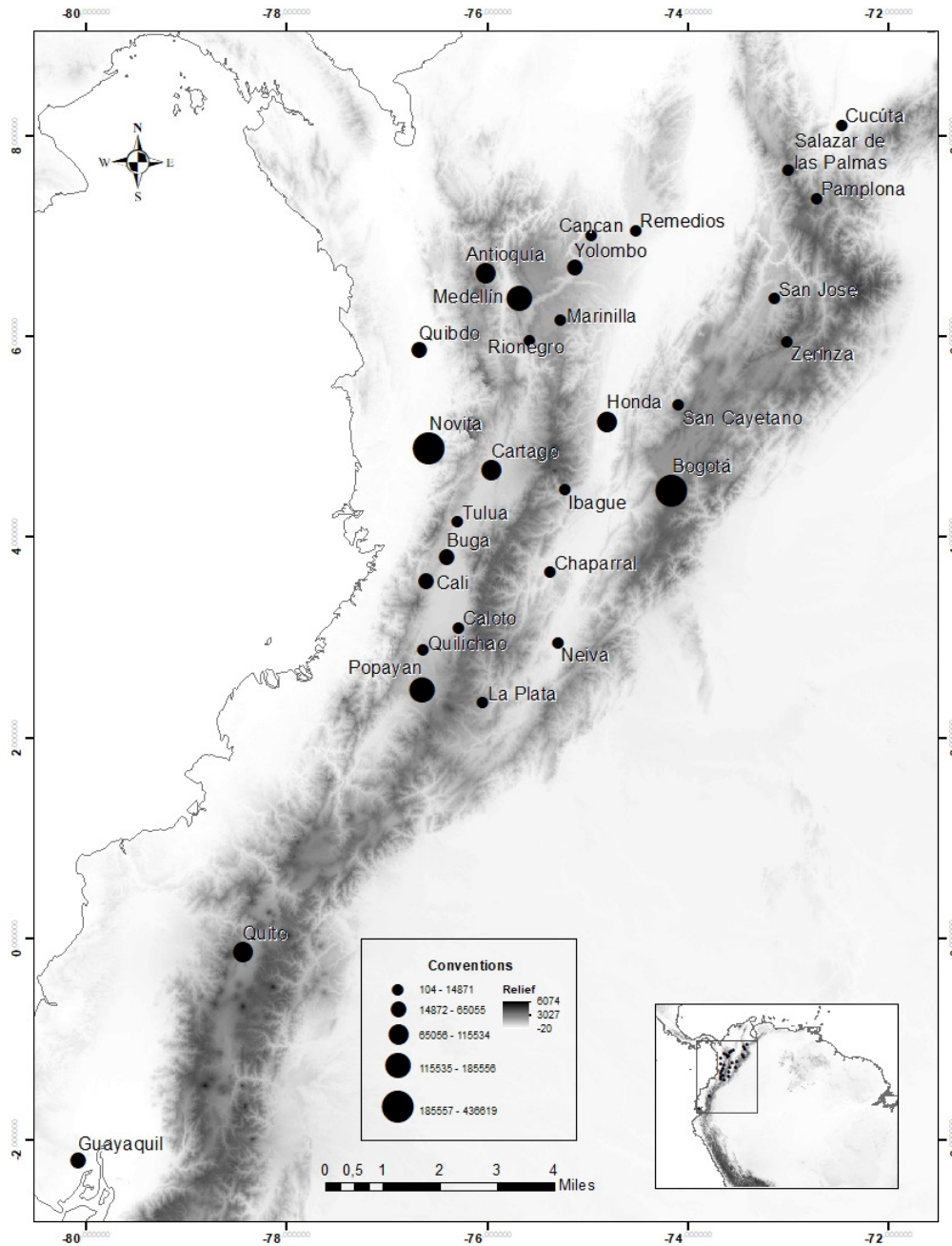
**Map 2. North Andean Monetary Agglomeration. Nodes weighted by their indegree (in silver pesos).**



Source: See text.



**Map 3.** North Andean Monetary Agglomeration. Nodes weighted by their outdegree (in silver pesos).



Source: See text.



Administratively, the northern Andes encompassed the Viceroyalty of the New Kingdom of Granada, established in 1739. It agglutinated the two bodies that hitherto had governed the region: The Audiencias of Santafé de Bogotá and Quito. The captaincy of Venezuela was also originally included in the political unit but by the late 1770's the region was formally rewarded with executive and judicial autonomy. The western portion of the Captaincy (Maracaibo-Mérida), however, kept important economic connections with the Viceroyalty. The jurisdiction of the Audiencias of Bogotá and Quito roughly coincides with the territories of present-day Colombia and Ecuador respectively. Historians have researched the two regions separately on the grounds that the viceroyalty was a mere political union with few economic and social connections.<sup>2</sup> This paper, however, echoes the results of recent scholarship in the sense that, though recognizing the economic differences between the two regions, it is necessary to study them in an integrated manner (Torres, 2018).

New Granada was the largest gold producer of the Spanish Empire. It accounted for roughly 55% of yellow metal production followed by New Spain (20%), Peru and Upper Peru (10%), Chile (10%) and other regions (5%) (Tepaske, 2010, p. 30). During the eighteenth century, the region experienced two mining cycles interrupted by a slump in the mid-century. The motives behind such cycles remain a matter of debate. An amalgamation of fiscal incentives, population growth and relative prices seems to explain the development of colonial mining (Torres, 2013, pp. 211-212). It is clear, however, that by the end of the second cycle New Granada became one of the world's largest gold producers. In the first half of the century, Brazil produced roughly ten times more yellow metal than New Granada (Tepaske, 2010, p. 54). By the end of the century, however, the decline of the former and the growth of the latter eliminated the gap. In the global context, the decline of western African ore exports amplified the share of the Northern Andes in international gold markets (Curtin, 1983, p. 250).

The mining cycle of the second half of the eighteenth century was dominated by four regions all of them located in western New Granada: Antioquia in the highlands that surrounded the lower Cauca valley, Chocó and, Barbacoas in the lowlands of the Pacific Littoral, and Popayán in the highlands of the Upper Cauca Valley (McFarlane, 1993, pp. 83-84). Scattered gold deposits across the eastern cordillera, the upper Magdalena valley and the Zaruma mining belt in southern Ecuador constituted secondary sources of yellow metal. By 1800, Antioquia produced roughly 35% of the viceroyalty's gold, followed by Barbacoas (19%), Popayán (19%), Chocó (19%) and other deposits (8%).<sup>3</sup> Most gold was produced in alluvial deposits. There were, however, regional differences in terms of labor, capital intensity, and geological endowments.

During the first mining cycle, approximately 90% of the gold production in the mines of the Pacific Littoral and Popayán employed slave labor (Sharp, 1976, pp. 173-180). In the second cycle (1760-1800) the share dropped to 60-70% given the rise of independent gold seekers and

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2 In this paper, I use the term New Granada to refer to present-day Colombia. I use the term Audience of Quito or simply the Audience to refer to present-day Ecuador. I use the term viceroyalty when analyzing the northern Andes as a whole. Even though Panamá also belonged to the viceroyalty, I will analyze it in a separate paper.

3 For data on gold production in the big-four see McFarlane (1993, pp. 84-85). For the other regions see Torres (2012, pp. 522-523) and Lane (2004, p. 77).

miners (*mazamorreros*) who panned in the streams. Most of them were former slaves and mestizos. In Antioquia, the proportion was the opposite: 70% of the yellow metal was produced by *mazamorreros* (including poor whites) and 30% by slave gangs (Twinam, 1982, pp. 31-33). In most of the regions wage labor was marginal.

Even though alluvial mining did not foster the forward and backward linkages of hard-rock mining, consumer linkages were pivotal in creating a market big enough to promote interregional trade. The access of the population to bullion and specie was broader than previously thought. Small, independent miners were highly sensitive to the movement of relative prices and created consumer linkages that cemented interregional trade (Torres, 2013). Mines were thus not mere enclaves or non-market-oriented complexes *à la* Witold Kula, two conceptions which have shaped the historiography on mining in the region.<sup>4</sup>

How did gold intertwine the regions of the Viceroyalty? According to Maurice Brungardt (1990), the region divided into two great parts: a western and eastern section. Western New Granada which encompassed the mining regions and eastern New Granada which encompassed the manufacture and agricultural-oriented regions. In his scheme, there was an agrarian “net transfer [that] passed from east to west in return for precious metals of Western Colombia” (1990, p. 179). This scheme is valuable because underscores the importance of interregional connections, yet it hides its multilateral nature and does not include the Audience of Quito. Recent literature has studied the size and direction of staples and commodity flows in some regions of the northern Andes (Munoz & Torres, 2013; Torres, 2018).

There were four big entrepôts of trade. Bogotá, the capital of the viceroyalty, was the most important one for several reasons<sup>5</sup>. First, it had a foundry complex, a colonial mint and was at the center of the flow of fiscal remittances (*situados*). Second, it was the headquarter of a wealthy and highly monetized civil-religious bureaucracy and conglomerated religious institutions that provided credit across the region. Third, Bogotá’s population reached 30.000 inhabitants by 1810. This created a powerful market for staples produced in the Upper Magdalena Valley and the slopes and highlands of the eastern cordillera. Finally, it served as the distribution center of imported and domestic goods. Three staples were especially important: textiles, salt, and cacao. Textiles were produced in the eastern cordillera (Socorro, San Gil, Tunja) and were redistributed towards the mining regions and the lowlands along the Magdalena river. Most of the textiles were produced in a putting-out system that nurtured a market-oriented peasantry and promoted backward linkages in the production of cotton. Textiles produced by indigenous communities in the form of tribute or independent entrepreneurship were important as well. Salt was mined in Zipaquirá, a center which agglomerated an important group of workers and supplied far-away gold mining markets. Cacao, finally, was produced in plantations across the upper Magdalena valley, the eastern cordillera (Girón and Pamplona) and the Venezuelan Andes. It was consumed in the capital or distributed towards the mining regions.

Honda and Mompox, on the other hand, were two fluvial ports that redistributed European imports along the Magdalena River and served as entrepôts for the commodities that flowed from east to west. Honda was particularly important because it was the distributional center

4 This traditional view on Colombian mining is embodied in the works of Colmenares (1997a; 1997b) and Barona (1995). For a revisionist approach see Torres (2013; 2016).

5 For a lengthy analysis of commodity flows around Bogotá see (Munoz & Torres, 2013).



of the tobacco monopoly that supplied Antioquia and the factories of the eastern cordillera. Mompox, in turn, had a foundry that attracted bullion from Antioquia and scattered mining deposits in the Sinú valley. Likewise, the city had important connections with the Atlantic ports of Santa Marta and Riohacha that offered alternative sources of European imports (Daza, 2009, pp. 101-105).

Popayán, a city of almost 18.000 inhabitants, was the entrepot of southwestern New Granada though it faced competition from emerging cities in the lowlands such as Cali and Buga.<sup>6</sup> The city enjoyed similar advantages as Bogotá in terms of fiscal, administrative, religious and monetary infrastructure. It was at the center of the fiscal *situado* that was transferred from Quito to the Caribbean and possessed foundry and minting complexes. The size of its population also created a market for distant regions. Pasto, in the south, provided wheat. The upper Magdalena Valley supplied cacao and beef. However, the main distributional function of the city had to do with the trade in textiles and other staples produced in the Audience of Quito. The size of this trade, usually underestimated by the historiography, has recently assessed at half million pesos which was roughly equivalent to the trade between Quito and the Peruvian Andes (Torres, 2018).

The final internal entrepot was Quito, the biggest city in the Audience, with a population of roughly 25.000 inhabitants by 1800.<sup>7</sup> Even though the city did not have a colonial mint, it served as the primary intersection between Peruvian silver and New Granadian gold. It was the point at which the bimetallic streams were at full display. It served as the primary entrepot for the textile-producing villages (mainly Latacunga and Riobamba) that exported their products southwards (Peru) and northwards (New Granada). The city also redistributed staples produced in the coastal region and attracted Zaruma's gold (Lane, 2004). Salt and cacao from the coast, for instance, supplied the sierras between Pasto and Cuenca (Torres, 2018). Quito also enjoyed the fiscal and religious clusters that characterized Popayán and Bogotá. The size of its population, finally, created an important market in its own right.

Gold, in short, oiled the wheels of north Andean trade. The yellow metal also left the Andes to pay for European and intercolonial imports. Cartagena was the port through which the region traded with the Atlantic world. The city, however, not only served as commercial entrepot but also experienced a "subsidy-led growth" (Meisel, 2002). In fact, the city was the final destination of most of the fiscal remittances from the treasuries across the viceroyalty. These remittances financed building programs and oiled local trade through the payment of soldiers, bureaucrats, and workers. The port, on the other hand, was an important market for its hinterland and was a pivotal node in the processing and distribution of the tobacco monopoly.

Even though important, gold did not comprise the entire export base of the region. By the late eighteenth century the viceroyalty experienced a diversification of its exports. Cotton, tobacco, cacao and hides became important sources of revenue for some regions (Fisher, 1990, p. 155; McFarlane, 1993, pp. 131 and 199). This diversification also allowed other ports on the Atlantic such as Santa Marta and Riohacha to thrive. As we have seen above, the cacao produc-

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6 The role of Popayán in interregional trade networks has been explored in Torres (2016; 2018).

7 On the economic performance of the Audience of Quito and the role of interregional commodity flows see Contreras (1987), Andrien (1995) and Borchart (1998). For a critical reassessment of these and other works on colonial economic history of Ecuador see Torres (2018).

tion of the eastern cordillera used Maracaibo as an entrepot to reach international markets. The main commodity boom, however, was experienced by Guayaquil, the Pacific port of the Audience of Quito. The region specialized in the production of cacao to supply the Mexican market and also served as the entrepot for the European imports to the Audience (Hamerly, 1976; Mino, 2014). There was an additional stream that connected Guayaquil with the gold belts of the Pacific Littoral in the north but this has been much understudied. Guayaquil merchants supplied salt, Peruvian wines, and cacao to the gold mines of the Littoral Pacific (Torres, 2013, pp. 184-185).

This heterogeneous set of economies, then, sustained a multisided network of commodity flows across the Northern Andes. Markets and mining played a much more important role in allocating resources than previously thought. What were the coins and metals that lubricated north Andean trade? This is the subject of the following section.

### **Doubloons and *cuartillos*: A brief monetary history of the Northern Andes**

In certain ways, colonial Latin America can be interpreted as a juxtaposition of small double standard economies bonded by common monetary rules but separated by transaction costs and local economic structures. Gold coins in Bogotá were not a perfect substitute for gold coins held in Quito. What were those common monetary rules? As Cross (1983) pointed out, the Spanish crown synchronized the mint ratios of all the mints in the colonies. Likewise, mint prices and mint equivalents were kept closely coordinated. Under these parameters, the bimetallic nature of the money supply and bullion flows in the colonies were a function of the relative gold and silver stocks. Naturally, the movements of the market and legal ratios in the Atlantic world affected colonial markets. In this paper, however, I will focus on domestic bullion and monetary flows.

In the late colonial period, the currency of the Spanish American colonies experienced two debasements (1772; 1786) and one adjustment in its bimetallic ratio (1786) (Hamilton, 1944, pp. 24 and 29; Torres, 2014, p. 121). By 1786, the bullion content of silver coins was 2.28% below the pre-1772 level and 4.5% in the case of gold coins. The bimetallic ratio was fixed at 16.61:1, 3.8% above its pre-1786 level. These changes, naturally, should be understood *vis a vis* Spanish and European bullion markets. In 1779, the ratio of the former was pegged to that of the Spanish colonies (16:1 and 16.61:1 in 1786) (Hamilton, 1944, p. 35). Even though the ratio in Hamburg -which has been used traditionally as the benchmark to study international bullion markets- jumped from roughly 14.61:1 in the early 1789's to 16:1 in the late 1800's (Redish, 2000, p. 227), it is clear that the ratio in the Spanish Empire persistently overvalued gold over silver. Further research will establish the extent to which this imbalance affected bullion and monetary flows in the Northern Andes. In the meantime, what kind of coins circulated in the colony?

After the debasement of 1786, colonial mints were committed to produce gold coins of 21 karats (87.5 per cent fine) and silver coins of 10 *dineros* 20 grains (90.3 per cent fine) (Hamilton, 1944, p. 32). Gold coins were struck in several denominations generically known as doubloons (doblones) which were composed of *escudos* in units of 1 (*escudo* or *doblón sencillo*), 2 (*doblón*



*de a 4*), 4 (*doblon de a 8*) and 8-escudos (*doblon de a 16*).<sup>8</sup> Silver coins were struck in *reales* in the following denominations:  $\frac{1}{4}$  (*cuartillos*), 1 (*real sencillo*), 2 (*pesetas*), 4 and 8 (*pieza de a ocho*). In terms of bullion content, the monetary landscape is more complicated. Clipped, sweated and abraded coins known as *macuquinas* issued before the monetary reforms of the 1730's -in which the crown started to take over the administration of the colonial mints and also carried out a debasement-, circulated extensively up to the end of the colonial period and beyond (Torres, 2014, p. 121). Between the 1730's and the 1750's hammered coins were still issued but at a lower bullion content than the old *macuquinas*. After the introduction of milled coinage that produced a coin known as *monedas de cordoncillo* (edge-marked coins) or *fuertes*, the quality of the new specie improved but the debasements of 1772 and 1786 altered again its bullion content. The Crown enacted a recoinage process in 1772 that could not absorb the old currency (Torres, 2014, p. 123). In short, by the late colonial period, colonial currency encompassed a heterogeneous set of coins. How this heterogeneity shaped New Granada's monetary history? What were the specifics of the north Andean currency?

New Granada's monetary history diverged from the monetary history of New Spain and Peru in several aspects. First, the timing of its coinage modernization was slower than in New Spain but faster than in the south-central Andes (Torres, 2014, p. 121). The royal taking-over of the colonial mint in Bogotá took place in 1748 and in 1756 it began to produce milled coinage. Likewise, the mint was endowed with a purchase fund (*fondo de compras de metales*) which allowed it to purchase up to 80% of bullion bars on sight (Torres, 2014, p. 120). As in New Spain, this fund reduced the market power of bullion merchants. New Granada's mintage services, on the other hand, were more decentralized than in other colonies. In fact, the crown supported the opening of a mint in Popayán in 1758 which closed in 1764, but reopened permanently with milled coinage in 1772 (Torres, 2014, p. 125). Despite having a smaller population and smaller bullion production, New Granada did not suffer from a centralized mintage service like New Spain.

Second, the range of denominations issued in New Granada's mints was unusual in the context of the empire. In fact, these mints specialized in issuing gold coins and, as stated above, silver coinage was small given the lack of silver mines. Since the seventeenth century, however, most of the New Granadian gray metal was coined in *cuartillos*, the coin of smallest denomination (Torres, 2013b, p. 196). The mints of Mexico City, Lima and Potosí only issued these coins after 1791 in the context of a huge debate about the shortage of small change. Even then, surprisingly, New Granada's mints issued more *cuartillos* than the silver giants' mints (Torres, 2013b, p. 197). In regards to gold coinage, New Granada was also an atypical case since its mints issued coins of 1 and 2 *escudos* in higher proportion than other imperial mints. This pattern in part explains why the stores of the interior of the viceroyalty did not suffer from *tla-cos* and other pseudo-currencies issued by storeowners in other colonies to the detriment of consumers. This uniqueness is explained in part by the fact that most of New Granada's silver was *plata de cimienta* (silver obtained as a by-product during minting) and legally belonged to the crown. There was a consensus among the mint's staff that this silver, as has been the tradition since the seventeenth century, should be issued in the form of *cuartillos*: a mix of independence and path dependence (Torres, 2013b, p. 198). This pattern resounded across the empire: when asked about the issuance about copper coinage to solve the problem of small

<sup>8</sup> In parenthesis I provide the name under which these coins were known in the Northern Andes. See Torres (2013b).

change, the director of the far-away Guatemala's mint said in 1792 that the solution lay simply in imitating the "famous Santafé's *cuartillos*" (Archivo General de Indias (hereafter, AGI) Ultramar, 837).

Even though useful in petty trade, *cuartillos* were not the only silver coins circulating in the viceroyalty. In a report about the currency of the viceroyalty, the Viceroy stated what other officials also reported continuously to the authorities in Madrid: most of the money supply was composed of Peruvian silver coins (*peruleras*) and a small amount of silver specie from Guatemala and Mexico City (AGI, Indiferente, 1769). One last peculiarity of the monetary history of the Northern Andes is that contemporaries and royal officers used to split the viceroyalty in two regions: lands of gold (*tierras de oro*) and lands of silver (*tierras de plata*) (Torres, 2013a, pp. 129-130). The former encompassed the mining regions and their hinterlands. The latter the eastern sections of the viceroyalty and the Audience of Quito. In the land of gold, the money supply was composed not only of silver and gold coins but also of gold dust. In private and royal ledgers, two units of account were frequently used: the *castellano*, a unit of weight equivalent to 4.6g and the gold peso, equivalent to two silver pesos. In the lands of silver, the circulation of gold dust was prohibited and the monetary supply was composed of coins and bars. The unit of account was the standard silver peso or piece of eight (1 peso= 8 reales= 4 *cuartillos*=32 *marevedies*). This monetary structure, naturally, generated transactions costs in terms of rate of exchanges, rounding, weighting, and uncertainty about the expected yield of the grade of gold dust. However, this structure was able to oil the wheels of North Andean trade.

### **Encomiendas and networks: New evidence on bullion and monetary flows**

After this long background, it is time to examine the evidence on precious metals flows. A creative combination of sources can help us to understand the direction and magnitude of these streams. The aggregate vision can be studied through a little-studied set of records: the logbooks of the Royal Post Office (*Reales Correos*). During the second half of the eighteenth century, the Crown slowly consolidated a regular, thorough set of *carreras* (mail routes) that covered the main cities and regions of the viceroyalty. Naturally, the main goal of the *carreras* was to establish a steady flow of information. Yet, the Office offered a service that by the late colonial period more and more inhabitants used: the *encomiendas* (specie transfers and package mail). In fact, the Office committed to transporting bullion, coins and small packages at attractive fees (table 1). In similar ways to institutions such as Wells Fargo during the gold rush era in nineteenth-century California, the Office fostered bullion flows across the region. Merchants, in particular, took advantage of this service by transporting bullion and commodities independently.

The royal officers reported systematically to the central treasuries the revenues from the *encomiendas*. However, they did not always provide a breakdown in terms of destinations, type of bullion (gold dust or bars), type of metal (silver or gold) and type of coins (doubloons, *fuertes* or *macuquina*). This disaggregated information is recorded on the daily logbooks (*libros manuales*) that contain information on the tariffs, name of sender and payee and the specific nature of the metal transported. Even though processing this information is a herculean task, it is the only way to get the required inputs. On the negative side, very few *libros manuales* survive either



in Spain, Colombia or Ecuador. The books of some regions are unknown. Yet, with the sources available it is possible to build a matrix of bullion flows in 1791 and 1792.

Fortunately, these years are “normal” in the sense that they did not experience external (e.g. wars) or internal shocks (e.g. bad harvests)<sup>9</sup>. I have checked the extent to which this biennium is representative of the late colonial patterns by analyzing data from the extant information for the main branches (Bogotá, Quito, and Popayán) between 1785 and 1795, branches for which the data is relatively complete. I have obtained the annual relative shares of the four top destinations from each brand and calculated their mean and standard deviation. During these years the standard deviation of the share of each destination fluctuated between 8.5%-10.4% of the mean in Bogotá, 6.6-10.1% in Popayán and 7.8-10.8% in Quito. In other words, the data was tightly clustered around the mean and the volatility was low. The 1791-1792 patterns, then, fairly describe the relative patterns of the peaceful decade. Further research should study how the escalation of the Atlantic wars after 1796 affected bullion and monetary flows.

Before I further analyze the data, however, it is important to note that not all precious metals flowed through the post office. The information on Bogotá’s doubloons exports shows that less than 20% of the newly minted gold coins found their destination through the Office services. In the same vein, we do not have information on two vital nodes: Mompox and Barbaçoas. The Audience of Quito is underrepresented because we only have data for Quito and Guayaquil. We do not have information on the branch offices of Riobamba, Latacunga and Cuenca. Therefore, in the networks they only appear as importers but not as exporters. Under these conditions, what is the usefulness of the *encomienda* records? It is a sample that allowed us to identify the direction and nature of private bullion and monetary flows<sup>10</sup>. Even though it is risky to use the sample to establish stream magnitudes, it is possible to detect the relative importance of some destinations and to apply basic tools of network analysis.

Figures 2-5 deploy the inter-city network of doubloons, bullion (gold dust and bars) and silver coins. Figure 5 depicts the aggregate network or the summation of both bullion and monetary flows. The networks are nonsymmetrical and therefore the edges are drawn as arrows indicating the direction of the flow and the origin and target or “sink” nodes. Two additional features have been displayed. First, the width of the line indicates the value or strength of the tie. Second, the size of the node is a function of its degree, that is, the number of edges connected to the node. Naturally, the latter feature should be understood in proper context. In tables 2-6 I display the values of the top 10 nodes in terms of its in-degree and out-degree values (see also maps 2 and 3). In nonsymmetrical matrices, the former is the number of ties received by a given node and the latter is the number of ties initiated by that node. Since our data is valued in standard silver pesos, then the degrees (in and out) will consist of the sums of the values of the ties in silver pesos.

The doubloon network (figure 1) informs that there were four main ties through which gold coins flowed across the northern Andes. Two traditional ties (Bogotá-Cartagena and Honda-Cartagena) will not arise surprise. They are the monetary side of the importation of Eu-

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9 AGI, Correos, 124-135B and 224A-225B; Archivo General de la Nación (hereafter AGN) SAAll, Administración de Correos, boxes 1-9: We have interpolated lacunae with extant logbooks in former and subsequent biennium.

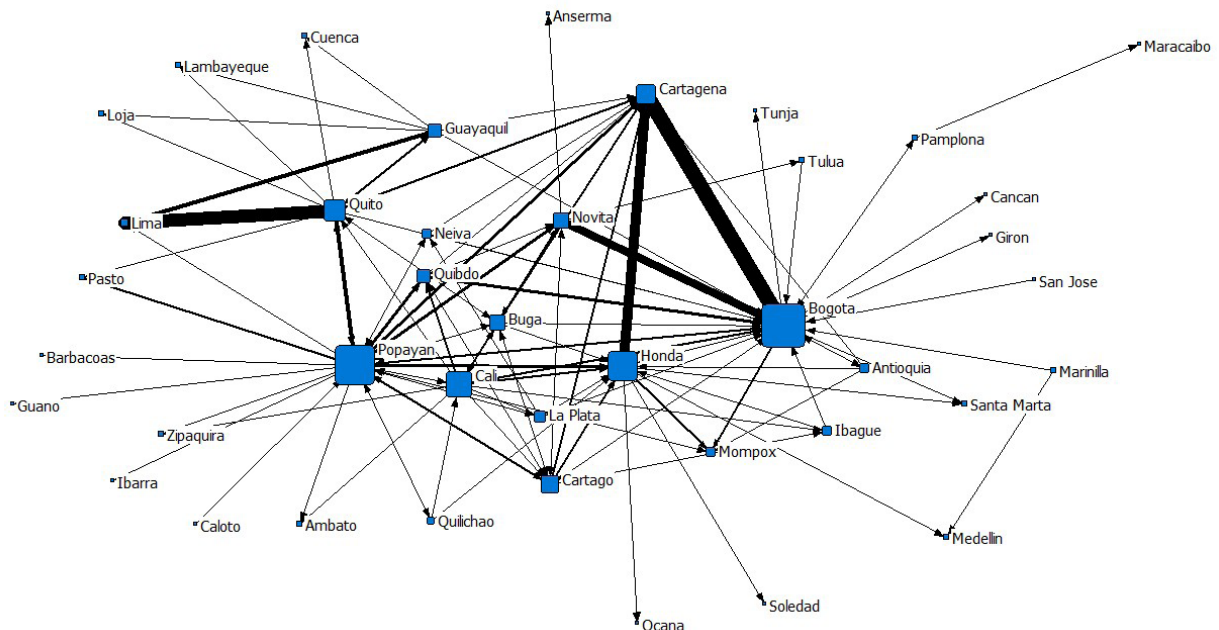
10 Fernando Jumar (2004) has shown the importance of mail boats (*fragatas-correos*) in specie exports. This article, then, shows that overland mail routes are also useful to the analysis of domestic specie flows.



ropean goods. The role of Honda in funneling doubloons from a heterogenous set of nodes, however, reflects a thriving intercordilleran trade whose dynamics remain to be studied. The thickness of the tie Nóvita-Bogotá suggests that the latter released considerable amounts of doubloons towards the mines of the Pacific littoral. Historians traditionally have sustained that the region simply paid for regional imports in gold dust or bars (a system called *rescate*). However, the data shows that miners and gold merchants actively exchanged their bullion for coins. The advantage of coinage over bullion in terms of transaction costs probably explain this demand for gold coins (Torres 2013). Finally, the Quito-Lima tie suggests that an important portion of New Granadian doubloons were absorbed by Peruvian ports. Cartagena, then, was not the only passage of north Andean gold towards the world economy.

There was a second set of intermediate ties that revolved around Popayán, some cities of the upper Cauca Valley, and Guayaquil. Popayán released doubloons towards both Cartagena and Quito to pay for European and regional imports. Again, these ties are well-known in the literature. However, the city also sent gold coins towards the mining regions (Novita and Quibdó) and sustained a very interesting cluster of doubloon flows with Cali, Buga and Cartago in the Cauca Valley, and La Plata and Honda in the upper Magdalena valley. The former three cities also participated actively in the sending of doubloons to the Pacific. The case of Guayaquil is suggestive because most of the gold it sent to Lima was not imported from Quito. Merchants based in the latter transported their doubloons overland, through Piura. It is likely that Guayaquil absorbed doubloons from its salt and wine trade with the mines of the Pacific Littoral. Therefore, it is also possible that the huge exportation of doubloons from Bogotá to Nóvita was nurturing trade networks in the Pacific.

**Figure 1. Doubloon flows in the Northern Andes. 1791-1792**



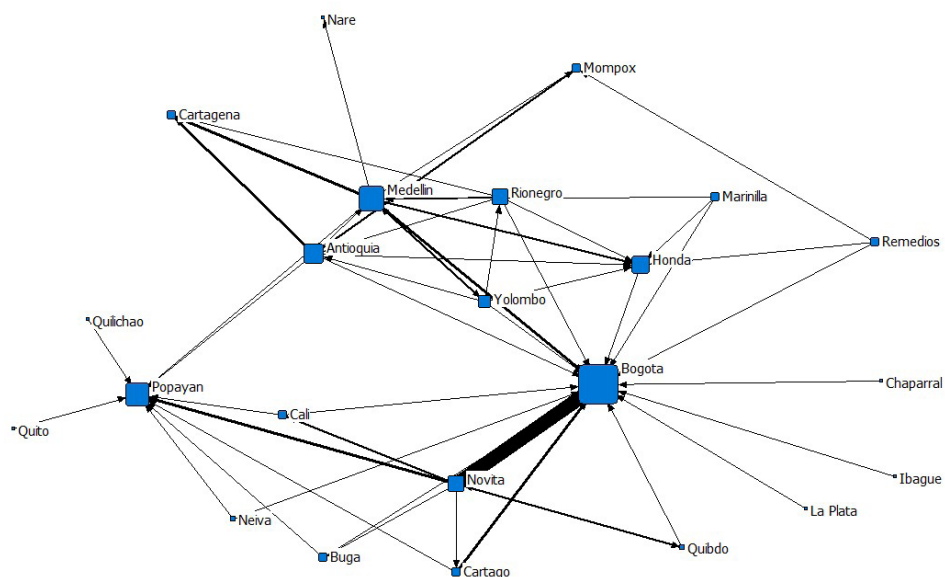
Source: AGI, Correos, 124-135B and 224A-225B; AGN, SAAI, Administración de Correos, boxes 1-9

This outline of the doubloons networks is enhanced with the data from the degrees (table 2). The in-degree suggest that the top four nodes absorbed 75% of all the doubloons shipped in the biennium. Interestingly, Lima absorbed 19% and the Chocó (Nóvita and Quibdó) 22% of the remittances only surpassed by Cartagena (36%). The remaining 25% of the doubloons were absorbed by a wide set of nodes distributed across the region. This is an indicator that gold coins played an important role in settling deficits in the balance of payments in regions traditionally considered outside the gold orbit such as Cuenca, La Plata and Girón to provide three extreme cases.

The out-degree (table 2), on the other hand, confirms the central role of Bogotá, Popayán and Quito as the Andean entrepots for gold coins. They accounted for 68% of doubloon remittances. The centrality of these cities in the network is explained by the services they offered. Most fascinating, however, is that the data confirms the importance of the Cauca Valley cluster (Cali, Buga, Cartago, and Quilichao) and Guayaquil in this network. Mining regions also released some doubloons back to some nodes in the interior of the viceroyalty which reflects the multilateral nature of regional trade.

The flow of gold in the form of bullion (dust and bars) interwove a less complex network that reveals, notwithstanding, very interesting features (figure 2). The capacity of the viceregal capital to attract gold from different mining belts is beyond doubt. However, the enormous width of the tie Novita-Bogotá reveals that the merchants of this city had successfully penetrated a market that has been traditionally linked with Popayán. The latter, though underestimated in our data because the lack of data on Barbacoas, absorbed gold from a smaller cluster than Bogotá. The bullion flows of the Antioquia mining belt reveal an equilibrated connection with Cartagena, Honda, Mompox and Bogotá. In a similar vein, there is an interesting gold flow across the different cities of Antioquia that confirms the role of bullion in cementing local trade in the region.

**Figure 2. Gold dust and bars flows in the Northern Andes, 1791-1792**



Sources: AGI, Correos, 124-135B and 224A-225B; AGN, SAAIL, Administración de Correos, boxes 1-9

How are these outlines reflected in the degrees? The in-degrees suggest that 57% of the gold was absorbed by Bogotá. Even though Cartagena's share was only 13%, the port was able to attract gold bars no doubt because some merchants and miners were not willing to accept the trade-off between seignorage and the convenience posed by coined gold. This pattern is particularly true in Antioquia. If we further breakdown the destination of bullion sent from this region, Cartagena absorbed 40% of gold remittances from Medellín and 40% from Santafé de Antioquia. Bogotá absorbed only 33 and 14% respectively. The out-degrees, finally, simply confirms the importance of Chocó and Antioquia as the main sources of yellow metal. Yet, the out-degrees also reveals the importance of nodes such as Cartago, Cali and Honda in the flow of non-coined gold.

The network of silver flows should be read in regard to two important aspects. First, silver coins accounted for a small part of the aggregate monetary flows. The flow of doubloons involved roughly 1.400.000 silver pesos in contrast to the 145.000 silver pesos in the flow of the gray metal. This gap, naturally, reflects the importance of gold mining in the region and the advantage of gold over silver in terms of transport costs (see table 1). Second, the network does not include the movement of silver *fuerte*. In other words, it includes essentially *macuquinas* and other old silver coins.

Graph 3 displays the result. Several clusters spring from the network. Quito released silver towards markets the north. The ties between Quito-Popayán and Quito-Santafé were surprisingly active. These streams reveal Quito's role as a sort of bimetallic gear sending silver (no doubt of Peruvian origin) northwards and gold southwards. The importance of this role is confirmed by the fact that Quito was the most important source node of silver in the northern Andes (see table 4). In the Audience, the importance of the tie Guayaquil-Cuenca suggests that the coastal exporting boom irrigated silver in the southern regions of the Audience. Cuenca's role as a silver sink node confirms that its expansion was accompanied by a larger flow of specie.

The cities in the upper Cauca Valley developed one of the most important silver clusters. Cali, for instance, became the most important north Andean sink node by controlling roughly 18% of silver receipts. Buga, on the other hand, was the second silver source node of the viceroyalty. The importance of these streams in both cities reveals their capacity to insert themselves into an expanding, multilateral trade system which included the mining regions in the pacific, the manufacture-driven economy of Quito and the commercial oriented complexes of the Magdalena Valley and Eastern New Granada.

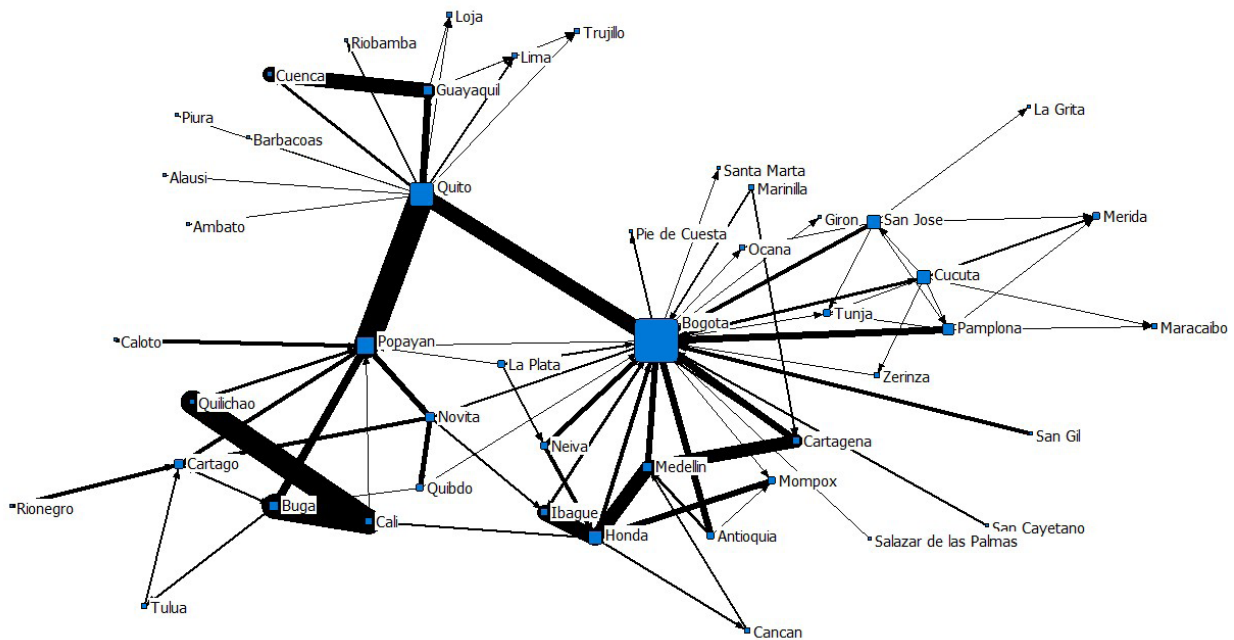
Gold mining regions also participated actively in silver flows. Medellín, for instance, became an important node in this network by importing and exporting silver coins to Honda, Bogotá, and Cartagena. This suggests that market forces responded positively to the state-led effort to foster the introduction of silver coinage to the region (Torres 2013, p. 131). Even though the inflow of silver into the mining regions of the Pacific was not as impressive as in the Antioquia mining belt, both Nóvita and Quibdó were also silver target nodes. This reinforces the fact that coinage played an important role in the domestic trade of the mining belts.

Bogotá once again demonstrated its centrality in these flows by developing a spoke-like network with nodes in the eastern cordillera and the mining belts. The importance of this network is confirmed by the fact that Bogotá was the second silver sink node of the region. Two additional clusters deserve further research. First, the north-east regions of the viceroyalty



developed a network that connected nodes such as Pamplona and Cúcuta with Venezuelan nodes such as Mérida and Maracaibo. In references back to graph 1, gold coins flowed to the opposite direction. The extent to which this bimetallic network drove an active interexchange of precious metals remains a matter subject to the analysis of the Office branches of western Venezuela.

**Figure 3. Silver flows in the Northern Andes, 1791-1792**



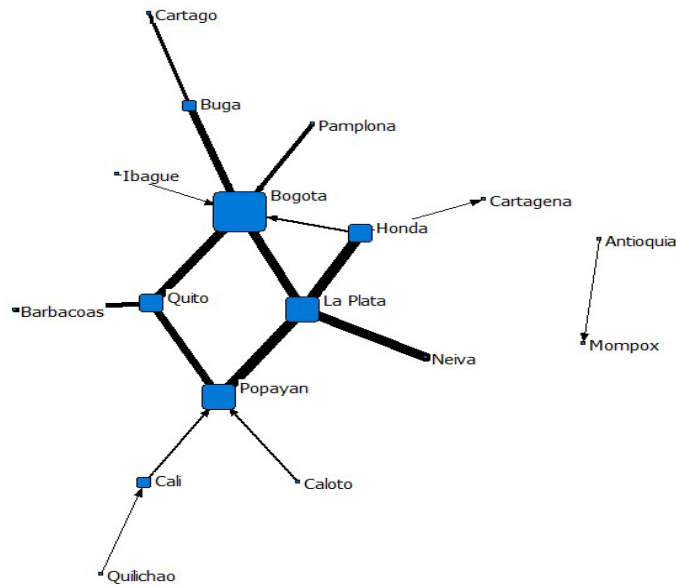
Sources: AGI, Correos, 124-135B and 224A-225B; AGN, SAAI, Administración de Correos, boxes 1-9

The network of silver *fuertes* is smaller and less complex (figure 4). It reflects the marginal quantities (7.125 silver pesos) of this specie that flowed in the region. Yet, it is interesting that the backbone of the network revolved around a four-fold cluster between Quito, Bogotá, Popayán and La Plata. Quito obtained this specie from Lima and Guayaquil and released silver *fuerte* towards markets in the north. Popayán and Bogotá were the main destinations. The importance of La Plata, however, begs for an explanation. The village was an important entrepot on the road that connected the upper Magdalena with Popayán (Clavijo, 2012). The reason why part of this trade was settled in *fuertes* and not in *macuquina*, however, requires further research.

Let's briefly analyze the aggregate network of bullion and coin flows. One interesting element from network analysis is the "cut-point". If one of those points is removed, the network splits into several components or blocks. The aggregate network has 6 cut-points (nodes in red in figure 5) and therefore several blocks, three of which are relevant: the block of the Audience of Quito, the block of New Granada's mining regions and the cluster of the eastern section of the viceroyalty. These components coincide roughly with the contemporaries' division of the monetary structures in "lands of silver" and "lands of gold". The flow of precious

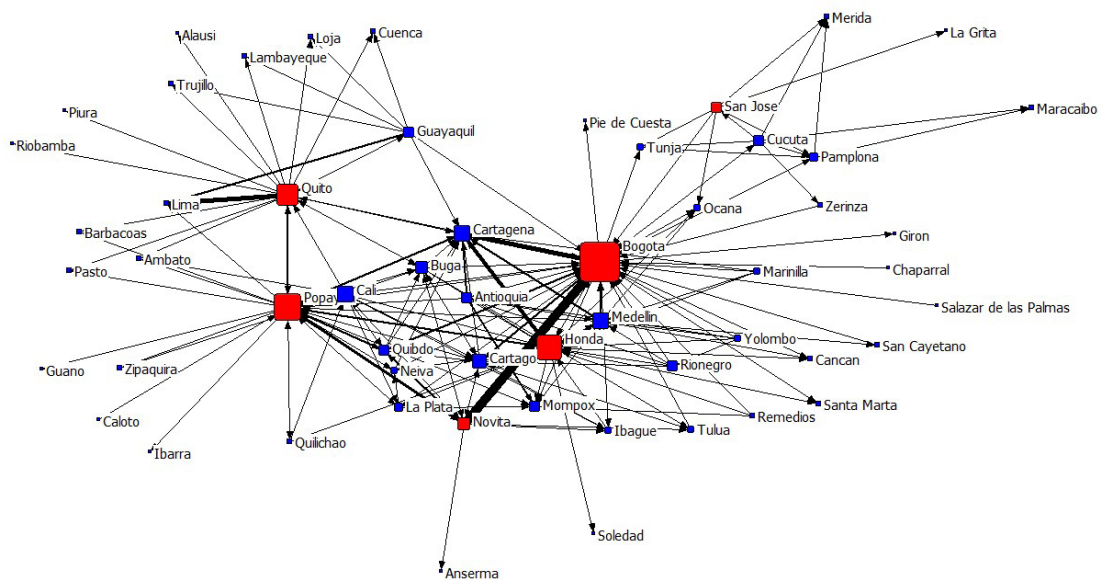
metals between these segments reveals the interconnected nature of the monetary system. This block pattern is relevant for regional historians since it provides new ways to study regions and regional connections.

**Figure 4. Silver fuerte flows 1791-1792**



Sources: AGI, Correos, 124-135B and 224A-225B; AGN, SAAL, Administración de Correos, boxes 1-9

**Figure 5. Bullion and monetary flows in the Northern Andes**



Sources: AGI, Correos, 124-135B and 224A-225B; AGN, SAAL, Administración de Correos, boxes 1-9



It is not surprising that the three big Andean entrepôts Bogotá, Popayán, and Quito also happened to be cut-points of the network. They not only clustered bimetallic flows but also acted as nodes that connected different blocks. The other three cut-points (San José, Nóvita and Honda) suggest also the dynamism of certain regions. San José, in the eastern-most portion of the viceroyalty, played an important role in connecting New Granada with the silver flows of Maracaibo and Merida. The width of these ties would have been greater had we had the information on Merida and Maracaibo that released silver towards the interior. Nóvita was the bullion entrepôt of the Chocó belt given the importance of its foundry. The role of Honda as a cut-point reveals its increasing importance in the interregional trade network of southwestern New Granada.

Finally, the aggregate in-degrees and out-degrees could be harnessed as a crude, yet interesting proxy to the structure of the regional balance of payments (table 6)<sup>11</sup>. The enormous surplus of Bogotá is not surprising given its cluster of economic and fiscal services. Likewise, the role of Cartagena as a hub of the precious metals from the Andean interior is well represented in the data. Yet, the enormous role of Lima in absorbing gold from New Granada is a call for a more integrated history of the northern Andes. The deficits in Quito and Popayán, on the other hand, are no doubt reflection of the lack of data on Barbacoas and other markets of the Audience. The mining regions faced perennial deficits, yet it is interesting that they participated in a multilateral flow of silver and gold coins. Novita exported 436.619 silver pesos, 424.436 of which were in bullion and the remaining in silver and gold coins. It imported, however, 115.574 silver pesos in silver and gold coins and 34.453 in bullion. Therefore, 27% of bullion exports returned in the form of coins. As stated above, this means that the *rescate* not only involved a simple barter exchange of bullion for goods but also transactions in which coins were used. In Antioquia the ratio of bullion exports to coin imports was less than 15% perhaps because we do not have data on Mompox remittances. All in all, the importation of doubloons to Antioquia is a symptom that gold coins played an important role in the regional money supply *vis a vis* gold dust.

## Bringing back classical sources in: notaries and merchants

The data from the *encomiendas* has provided suggestive insights on precious metals flows. Additional evidence could be found in a source well-known among colonial historians: notary records (*escribanos*). I have assembled a sample of credit transactions in Popayán and Quito. Torres (2013c) analyzed time series of credit purchases and cash loans provided by merchants between 1760 and 1810 in Bogotá's notaries which can be used to craft an overview of bullion and monetary flows in the three main Andean entrepôts. Quito's sample is composed of all transactions carried out by merchants recorded on the extant notaries in the Ecuadorian National Archives (hereafter ANE) between 1760 and 1809. A total of 115 transactions were unearthed despite the deterioration of several volumes of the ANE's notarial section.<sup>12</sup> Popa-

11 In his well-known report on the general state of the viceroyalty, the Captain Joaquín Durán drafted a report on the *encomiendas* which only included Bogotá in 1791 (2012 [1794]:125). The report was also used by Durán as a proxy of aggregate bullion and monetary flows. Our data roughly coincides with his aggregate numbers though we diverge on the size of Cartagena's receipts from Bogotá.

12 ANE, Protocolos, Notarías1-5, 1760-1809.

yan's notary records are preserved in better conditions in the Archivo Central del Cauca (hereafter ACC).<sup>13</sup> Given the size of the records, I sampled all transactions of Popayan's notaries in even years between 1760 and 1809. Thus, I study 914 credit purchases and cash loans extended by merchants. Naturally, the goal is not to carry out an analysis of merchant credit in colonial New Granada and Quito. Therefore, I will focus on two aspects: the type of metals involved (gold or silver, bullion or coins) and the nature of the repayment of credit. In addition, I will divide the period into two sections: the transition period (1760-1780) and the late colonial period (1781-1810).

Before addressing the data, a brief comparison between the volume of cash loans and European goods sold on credit in Bogotá and Popayán reveals important differences in both markets. In the latter, merchants extended cash loans for 276.938 silver pesos, 221.069 of which in silver coins and the residual in doubloons. If one assumes that the records of uneven years are roughly comparable to those in the sample, Popayán's merchants extended cash loans for roughly 550.000 silver pesos. Bogotá's volume of credit was greater. In the capital, merchants extended credit for 1'912. 436 silver pesos, 1'025.192 of which in silver coins and 887.244 in doubloons. Torres's sample included 2/3 of Bogotá's notaries (2013c). Therefore, it is likely that the capital's portfolio recorded in the notaries was around five times that of Popayán's. The volume of imported goods sold on credit in both cities is more comparable. Around 1'744.418 silver pesos in European goods were recorded in Popayán notaries against 3'036.271 pesos in Bogotá. These numbers underline the importance of the two cities in the internal distribution of imports. One last point is worth mentioning: Popayán's merchants recorded in the notaries their sales of domestic textiles (*ropas de la tierra* or *ropas de Quito*) while Bogotá's merchants rarely did so.

Tables 7-10 summarize Quito's transactions. A first structural trend that springs from the data is that 59% of merchant's cash loans in silver coins were supposed to be settled in doubloons, gold dust or gold bars. In only 23% of the loans debtors offered a repayment in silver coins. The remaining 18% was supposed to be settled in goods 13.5% of which in domestic textiles, 3.5 % in staples and 1% in other manufactures. These patterns, however, show revealing transformations over time. During the period 1760-1780, 50% of the silver loans were supposed to be settled in the same metal. In the following period this share dropped to only 5%. The share of repayments in gold surged from 45 to 67% and the repayment in goods from 5 to 28%. In short, most of the cash loans in silver coin financed activities to attract gold coins and bullion directly or indirectly from the north. This pattern experienced an expansion during the late colonial period and confirms the data displayed on the networks.

The cash loans in doubloons of Quito's merchants reveal also interesting patterns. First, 86% of these loans were systematically invested (*empleados*) in the Lima trade (*comercio de Lima*) to purchase European goods or to exchange doubloons for silver coins. This loans tripled during the late colonial period<sup>14</sup>. Notarial records confirm that New Grenadian gold coins flowed towards Lima via Quito. In addition, Quito's role as a bimetallic hub is beyond doubt. Second, the

13 ACC, Escribanos de Popayán, 1760-1799.

14 Some specialists on the economic history of Ecuador were well aware of the importance of Lima as a destination of Quito's gold exports. Borchart (1998:332) analyzed several notarial transactions but in a rare case of intellectual honesty pointed out that "given the lack of studies on the monetary history of Santa Fe and Lima, these *escrituras* are very difficult to evaluate". This paper, then, provides a powerful contribution to this field.



remaining 14% of these loans were supposed to be settled in gold dust from mining regions in the north and Zaruma in the south. This explains why in the figure 1, Quito released small yet suggestive amounts of doubloons towards Loja and Barbacoas.

The records on European goods purchased on credit shows that the repayment of these transactions were settled mostly in silver coins (60%) followed by domestic textiles (28%) and only 12% doubloons and gold dust. Even though the share of doubloons in these transactions climbed to 24% in the late colonial period, it is clear that the preferred metal to pay for imports was silver. The records on *ropas de la tierra* purchased on credit show a different pattern. Merchants asked their costumers to settle their purchases mostly in doubloons and gold dust (56%). Silver coins only accounted for 44% of the settlements. This counterpoint is explained by the market targeted in these transactions: European goods were distributed in markets across the Audience and the domestic textiles found their markets in the north. As expected in economic theory (the monetary application of Heckscher-Ohlin model), each region tended to specialize in exporting the relatively more plentiful money. For instance, a deficit between a region where silver was relatively more abundant and a region where it was relatively scarcer induced silver flows and vice versa.

Popayán market presented different patterns (tables 11-14). In contrast to Quito, 62% of cash loans in silver coins were settled in the same specie, only 32% in doubloons and bullion and 6% in staples. If one splits again the analysis into two periods, during the late colonial period the gold's share increased to 49% in detriment to silver coin's share. The consolidation of Popayán's mint after the 1770's and the reinforcement of ties with Barbacoas can explain this expansion of repayments in gold. In fact, around 39% of silver loans were extended to Barbacoas-based merchants who promised to pay in gold dust or doubloons obtained at the Popayán's mint.

Cash loans in doubloons were settled mostly in the same specie (74%) followed by gold bullion (17%) and silver (6%). In the late colonial period this preference for repayments in the same specie was even bigger (88%). Suggestively, 61% of doubloons were invested in the Cartagena trade (*carrera de Cartagena*) and 39% were extended to merchants in the mining belts. This information again confirms several patterns drafted in the network graphs. For instance, the relationship of the mining belts *vis a vis* the Andean entrepots consisted not only of a mere exchange of bullion for goods but also of a strong flow of silver and gold coins.

In similar ways to Quito's market, silver coins in Popayán were the preferred mean of payment for European goods purchased on credit (77%). Doubloons and bullion gold accounted only for 20% followed by other goods (3%). Even though the gold's share increased during the late colonial period, the hegemony of silver in these transactions was clear. What was the market targeted in these transactions? 31% of the European goods were bought by Quito merchants, followed by local merchants (28%), merchants from the mining belts and the Upper Cauca valley (17%) and Pasto merchants (13%). As expected most of these markets were silver-rich nodes who paid imports in their more plentiful money.

Silver coinage also played a vital role in in the settlement of *ropas de la tierra* purchased on credit. During the transition period (1760-1780), 87% of the goods' value was supposed to be paid in these coins. Even though this hegemony weakened in the late colonial period, doubloons and gold dust only accounted for 33% of the settlements. As for the geographical



distribution of the *ropas de la tierra*, merchants from Buga and Cali purchased 56%, followed by local merchants 23% and merchants from the mining belts (21%). Again, these patterns provide further evidence on the bimetallic and multilateral nature of the ways in which each market paid for its interregional trade.

## Final remarks

The lack of robust data has affected previous attempts to understand the nature and mechanics of colonial monetary systems. That is why it is necessary to deploy what Albert Hirschman once called “the empirical lantern” (Adelman, 2013, p. 371). Thus, the paper’s goal was to provide materials and insights on the way gold and silver intertwined in a complex, multilateral network that oiled the wheels of north Andean trade. In a less descriptive vein, future research will distill from these materials the microeconomics of bimetallicism in the region.

This paper, then, outlined general features of bullion and monetary flows by identifying a network with four types of nodes: Andean entrepôts, ports, mining regions and intermediate supply centers. In the three Andean entrepôts (Bogotá, Quito, and Popayán) bimetallic streams were at full display since they regulated the connection between silver-rich and gold-rich economies. Quito, for instance, channeled New Granadian gold southwards and Peruvian silver northwards. Andean nodes developed important monetary and bullion markets which thrived parallel to the distribution of goods and services. Mining nodes in western New Granada not only participated as mere exporters of bullion but also as active markets for doubloons and silver coins. Transaction costs and the multilateral nature of trade in the region can help to explain this pattern. The extent to which the consumer linkages of alluvial gold mining fostered this widespread use of money will remain an open matter of debate. Intermediate nodes such as Cali, Cuenca and La Plata participated actively in bimetallic flows and are clear examples of the way in which precious metals oiled trade in unexpected regions. Finally, the analysis of ports not only should include Cartagena but also Lima and to a lesser extent Guayaquil. The latter two absorbed huge quantities of doubloons which have been dismissed by scholars.

The paper, finally, underlined the far-flung nature of bullion and monetary flows in the region. Late colonial northern Andes encompassed a heterogeneous set of economies that have been studied separately. Scholars have assumed that even though these economies belonged formally to one political unit within the Spanish empire this union was merely an administrative one without effective economic integration. This paper shows that this contention has not been properly tested. Precious metals oiled the wheels of interregional and intercolonial trade in distant, yet connected regions.

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## Appendix

**Table 1. Transportation fees of bullion and coins through the Royal Post Office**

Origin	Destination	Type of metal	Fee	Origin	Destination	Type of metal	Fee
Antioquia	Honda	Gold bars	1%	Popayán	La Plata	Macuquina	1%
Antioquia	Bogotá	Gold bars	1%	Popayán	Buga	Dobloons	0.50%
Antioquia	Cartagena	Gold bars	1%	Buga	Cali	Macuquina	0.75%
Bogotá	Nóvita	Dobloons	0.50%	Buga	Popayán	Macuquina	1%
Bogotá	Neiva	Macuquina	2%	Buga	Honda	Dobloons	1%
Bogotá	Cartagena	Dobloons	1%	Buga	Quito	Dobloons	1%
Bogotá	Quibdó	Dobloons	0.50%	Buga	Bogotá	Dobloons	1%
Bogotá	Mompox	Dobloons	1%	Buga	Popayán	Gold dust	0.30%
Bogotá	Honda	Dobloons	0.30%	Cali	Ibagué	Dobloons	0.30%
Bogotá	Quito	Macuquina	3%	Cali	Cartagena	Dobloons	1%
Bogotá	Bucaramanga	Dobloons	1%	Cali	Nóvita	Dobloons	0.30%
Bogotá	Antioquia	Macuquina	3%	Cali	Quito	Dobloons	1%
Bogotá	Pamplona	Macuquina	3.00%	Quibdó	Nóvita	Gold dust	0.30%
Bogotá	Ocaña	Macuquina	2%	Quibdó	Cartagena	Dobloons	0.50%
Bogotá	Popayán	Dobloons	1%	Nóvita	Bogotá	Gold bars	0.50%
Bogotá	Cartagena	Macuquina	2%	Nóvita	Popayán	Gold bars	0.50%
Bogotá	Guaduas	Macuquina	1%	Nóvita	Cali	Dobloons	0.50%
Bogotá	Ibagué	Macuquina	1%	Cúcuta	Bogotá	Macuquina	2%
Bogotá	Mompox	Macuquina	2%	Cúcuta	Mérida	Macuquina	1%
Neiva	Cartagena	Dobloons	1%	Pamplona	Bogotá	Macuquina	3%
Popayán	Bogotá	Dobloons	1%	Rionegro	Honda	Gold dust	1%
Popayán	Cartagena	Dobloons	2%	Rionegro	Antioquia	Gold dust	0.50%
Popayán	Mompox	Dobloons	2%	Rionegro	Bogotá	Gold dust	1%
Popayán	Honda	Dobloons	1%	Antioquia	Bogotá	Gold bars	1%
Popayán	Quito	Dobloons	1%	Antioquia	Cartagena	Gold bars	1%
Popayán	Nóvita	Dobloons	0.30%	Antioquia	Mompox	Gold bars	1%
Popayán	La Plata	Dobloons	0.50%				

Source: own elaboration.

**Table 2. Dobloons flow network. Top 10 edges according to their centrality measures**

	Node	Indeg		Node	Outdeg
1	Cartagena	335428	1	Bogotá	290767
2	Lima	178153	2	Popayán	185576
3	Nóvita	124671	3	Quito	164211
4	Quibdó	61969	4	Honda	111880
5	Honda	57377	5	Cali	55670
6	Quito	38833	6	Guayaquil	43754
7	Bogotá	33827	7	Cartago	37402

Continúa -->

	Node	Indeg		Node	Outdeg
8	Cartago	23459	8	Buga	24912
9	Mompox	19030	9	Nóvita	10968
10	Popayán	13851	10	Quibdó	4411

Source: own elaboration.

**Table 3. Bullion (gold) flow network. Top 10 edges according to their centrality measures**

	Node	Indeg		Node	Outdeg
1	Bogotá	452139	1	Nóvita	424436
2	Cartagena	101290	2	Medellín	130616
3	Popayán	85436	3	Antioquia	88865
4	Honda	53185	4	Cartago	42807
5	Nóvita	34453	5	Quibdó	37926
6	Mompox	24887	6	Yolombó	26137
7	Medellín	14338	7	Cali	8934
8	Cali	12440	8	Rionegro	5835
9	Buga	4063	9	Marinilla	5337
10	Cartago	3805	10	Remedios	5117

Source: own elaboration.

**Table 4. Silver (macuquinas) flow network. Top 10 edges according to their centrality measures**

	Node	Indeg		Node	Outdeg
1	Cali	13359	1	Quito	12868
2	Bogotá	12402	2	Buga	9256
3	Popayán	10304	3	Medellín	8326
4	Honda	9440	4	Quilichao	7090
5	Cartagena	5541	5	Guayaquil	6109
6	Cuenca	4746	6	Bogotá	5951
7	Cartago	2828	7	Ibagué	4572
8	Quito	1876	8	Nóvita	2215
9	Mompox	1630	9	Popayán	2124
10	Antioquia	1594	10	Neiva	1918

Source: own elaboration.

**Table 5. Silver (fuerte) flow network. Top 5 edges according to their centrality measures**

	Node	Indeg		Node	Outdeg
1	Bogotá	1307	1	La Plata	1352
2	Honda	500	2	Quito	987
3	Neiva	500	3	Popayán	485
4	La Plata	485	4	Buga	425
5	Popayán	441	5	Pamplona	150

Source: own elaboration.



**Table 6. Bullion and monetary flows network. Top 10 edges according to their centrality measures**

	<b>Node</b>	<b>Indeg</b>		<b>Node</b>	<b>Outdeg</b>
1	Bogotá	496927	1	Nóvita	436619
2	Cartagena	442259	2	Bogotá	297168
3	Lima	178494	3	Popayán	185556
4	Nóvita	159374	4	Quito	178074
5	Honda	120002	5	Medellín	138942
6	Popayán	109561	6	Honda	115534
7	Quibdó	65480	7	Antioquia	91705
8	Mompox	46047	8	Cartago	80387
9	Quito	40709	9	Cali	65055
10	Cali	34559	10	Guayaquil	49863

Source: own elaboration.

**Table 7. Quito's credit market. Cash loans in silver and repayment method (in silver pesos)**

<b>Period</b>	<b>Total value of cash loans</b>	<b>Number of loans</b>	<b>Repayment in silver</b>	<b>Repayment in gold dust</b>	<b>Repayment in gold bars</b>	<b>Repayment in doubloons</b>	<b>Repayment in goods</b>
1758-80	35702	22	17900	5827	2778	7413	1784
1781-09	54509	25	3106	9773	200	26930	14550
1758-09	90211	47	21006	15600	2978	34343	16334

Source: own elaboration.

**Table 8. Quito's credit market. Cash loans in doubloons and repayment method (in silver pesos)**

<b>Period</b>	<b>Total value of cash loans</b>	<b>Number of loans</b>	<b>Repayment in silver</b>	<b>Repayment in gold dust</b>	<b>Repayment in gold bars</b>	<b>Repayment in doubloons</b>
1758-80	4684	3	0	0	2150	2534
1781-09	11681	4	0	0	0	11681
1758-09	16365	7	0	0	2150	14215

Source: own elaboration.



**Table 9. Quito's credit market. European goods sold on credit and repayment method (in silver pesos)**

Period	Total value of goods sold on credit	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in domestic textiles
1758-80	66920	19	34888	0	800	15320	16272
1781-09	120824	25	77474	4000	0	3211	35779
1758-09	187744	44	112362	4000	800	18531	52051

Source: own elaboration.

**Table 10. Quito's credit market. Domestic textiles sold on credit and repayment method (in silver pesos)**

Period	Total value of textiles sold on credit	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in other goods
1758-80	9830	8	1870	0	2800	5160	9830
1781-09	17019	7	9832	667	2996	3554	17019
1758-09	26849	15	11702	667	5796	8714	26849

Source: own elaboration.

**Table 11. Popayan's credit market. Cash loans in silver and repayment method (in silver pesos)**

Period	Total value of cash loans	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in goods
1758-80	78553	34	37970	12518	4000	16745	7300
1781-09	142536	73	100357	25053	0	11655	6198
1758-09	221069	107	138327	37571	4000	28400	13498

Source: own elaboration.

**Table 12. Popayan's credit market. Cash loans in doubloons and repayment method (in silver pesos)**

Period	Total value of cash loans	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in goods
1758-80	33000	8	0	0	2000	29000	2000
1781-09	22869	6	2000	0	8649	12400	0
1758-09	55869	14	2000	0	10469	41400	2000

Source: own elaboration.



**Table 13.** Popayan's credit market. European goods sold on credit and repayment method (in silver pesos)

Period	Total value of goods sold on credit	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in domestic textiles	Repayment in other goods
1758-80	627935	171	473118	7801	6287	117908	12229	10322
1781-09	1116483	409	898863	2402	10887	91650	80570	32111
1758-09	1744418	580	1371981	10203	17174	209558	92799	42433

Source: own elaboration.

**Table 14.** Popayan's credit market. Domestic textiles sold on credit and repayment method (in silver pesos)

Period	Total value of textiles sold on credit	Number of loans	Repayment in silver	Repayment in gold dust	Repayment in gold bars	Repayment in doubloons	Repayment in other goods
1758-80	190739	89	126844	0	1300	57621	4324
1781-09	216063	124	187277	466	3497	23503	1320
1758-09	406802	213	314121	466	4797	81124	5644

Source: own elaboration.