

The Impact of the Colombian Narcotrafficking Industry on Colombian Peso Currency Demand

An Exploratory Paper

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The shadow economy exists in virtually every economy. The shadow economy is generally described as any unregistered economic activities that contribute to the officially calculated Gross National Product and that would generally be taxable if they were reported to the tax authorities.¹ Shadow economies exist for many different reasons; some of which include tax and social security burdens, the intensity of regulations, changes in the labor market conditions and the employment system, and changes in individual values and general attitudes toward shadow economic activity.² Figure 1 demonstrates the main causes for the increase in shadow economy activities³. In general, shadow economies are minimized in countries that are part of the Organization for Economic Cooperation and Development (OECD), where shadow economies are generally between 14% and 16% of the official GDP. In transition countries, the shadow economy generally consists of 21% to 30% of the official GDP while in developing countries the shadow economy is on average 35% to 44% of the official GDP, with some exceptions.⁴ The shadow economy exists because the shadow economy and official economy perpetually compete against each other while also complementing each other. The official economy would not be able to effectively function without the shadow economy because of generally low-paid wages for low-productivity jobs in the shadow economy. This paper largely focuses on the Colombian shadow economy and the impact of narcotrafficking on currency demand in Colombia, therefore it is key to note that indirect taxation and unemployment are the most significant factors driving the Colombian shadow economy.⁵

¹ Schneider, Friedrich; Hametner, Bettina (2013) : The shadow economy in Colombia: Size and effect on economic growth, Working Paper, No. 1319, Johannes Kepler University of Linz, Department of Economics, Linz.

² Schneider, Friedrich; Enste, Dominik (March 2002): Hiding in the Shadows: The Growth of the Underground Economy, Economic Issues, No. 30, International Monetary Fund.

³ Schneider, Friedrich & Schneider, C. (2007). The shadow economies in middle and south america and their influence on the official economy: What do we know?.

⁴ Schneider and Enste

⁵ Schneider and Hametner

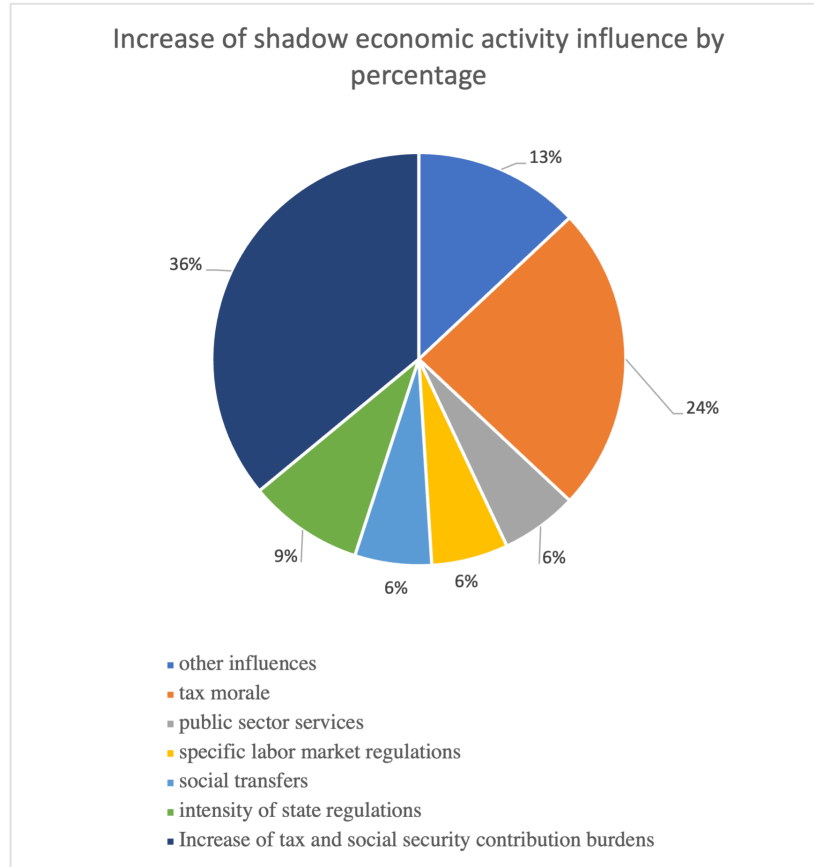


Figure 1: Increase of shadow economic activity influence by percentage

This paper focuses on the currency demand approach of measuring the shadow economy which utilizes the computation of discrepancies between declared income and the income implied by the observed currency demand.⁶ There are many ways of measuring the shadow economy, such as through sample surveys, tax audits, national accounting statistics, labor force statistics, transaction data, electricity consumption levels, and the model of latent variable approach.⁷ It is generally difficult to measure the shadow economy because of unreliable or incomplete data, therefore all different ways of measuring the shadow economy face criticism. For example, the currency demand approach faces criticism due to concerns about quantitative

⁶ Ahumada, Hildegart; Alvaredo, Facundo; Canavese, Alfredo J. (2006): The Demand for Currency Approach and the Size of the Shadow Economy: A Critical Assessment, University of California Berkeley, Berkeley Program in Law and Economics

⁷ Schneider and Enste

accuracy, times series properties, structural breaks, and sensitivity to units of measurement. However, to measure Colombia's experience with the shadow economy, the currency demand approach is the best form of measurement because it contains the most reliable and complete data set available when compared to other forms of measurement.

There are many currency demand factors in Colombia, such as changing inflation and interest rates, the impact of the COVID-19 pandemic, citizen confidence in the government, and more. In these findings, the aforementioned factors influencing currency demand in Colombia work as controls to understand how currency demand is impacted in ways other than through the shadow economy. Figure 2 demonstrates how inflation can be compared to currency demand in Colombia and aids in understanding how the shadow economy is not the only factor influencing currency demand.

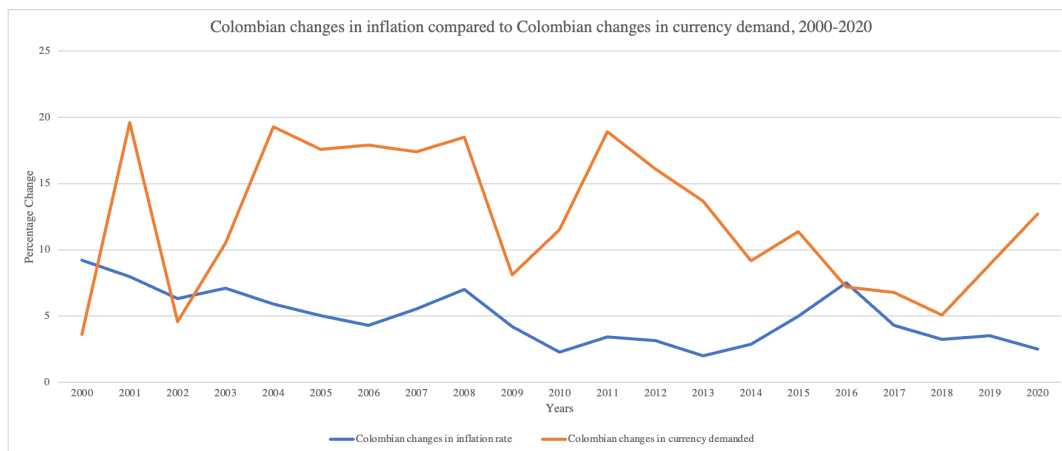


Figure 2: Colombian changes in inflation compared to Colombian changes in currency demand, 2000-2020

It is key to note the impact of the COVID-19 pandemic on Colombia as a whole. The pandemic especially impacted the shadow economy as Colombians scrambled to supplement their income, largely through the informal shadow economy. The COVID-19 pandemic reduced real GDP from 323.11 billion in 2019 to 270.3 billion in 2020.⁸ Additionally, the currency

⁸ World Bank Data.

demand in Colombia grew 12.70% in 2020 from its 2019 numbers. Consequently, real GDP per capita has yet to return to pre-pandemic numbers.

General public confidence in the government is instrumental in the Colombian shadow economy. A weak administration can create the perfect climate for shadow economies and corruption to grow as the public turns against their government. As of 2018, Colombia's government trust sits at 27% which is significantly below the OECD average of 45%.⁹ Between 2007 and 2018 the public's trust in the government decreased by 24 percentage points, demonstrating how Colombia is the perfect breeding ground for the shadow economy and general corruption.

For the OECD countries, the growth in shadow economies has been fastest in the 1990s: in the group as a whole, the shadow economy rose from 13 percent in 1990–93 to 17 percent in 1999–2000. Late in the decade, the shadow economy was still growing in most OECD countries.¹⁰ In Colombia, the height of the shadow economy was in the late 80s as this was the height of the cocaine trade and general narco-trafficking in Colombia and the surrounding areas. For this body of research, all historical data will include 1994 as a reference point because this was when the peg of the Colombian peso to the US dollar was changed to a floating exchange rate, causing Colombia's peso to fluctuate with its economy. Comparing data before and after this moment allows for a broader understanding of Colombia's government and economy's influence on the shadow economy.

Colombia's economy has changed drastically over the last half-century. At the beginning of the 20th century, Colombia was primarily a coffee-exporting country when the global economy was largely based on agriculture. However, the 1980s ushered in an explosion of

⁹ "Latin America and the Caribbean 2020: Colombia." Government at a Glance. OECD, 2020. <https://www.oecd.org/gov/gov-at-a-glance-lac-country-factsheet-2020-colombia.pdf> .

¹⁰ Schneider and Enste

cocaine demand and in the early 80s, drug trafficking was estimated to be around 7% of GDP or 70% of Colombian total exports. Like most OECD countries, the Colombian shadow economy boomed in the late 90s as the agriculture industry shifted from coffee to focus on coca plant cultivation, the primary product in cocaine. Between 1999 and 2003, the Colombian shadow economy grew from 39.1% of the official GDP to 43.4% of the official GDP when measured using the currency demand method.¹¹ Narcotrafficking requires more currency as it is an illegal business, therefore it is clear to see how currency demand is impacted given the extent of coca cultivation in Colombia and the influence of the shadow economy on the formal economy despite Colombia being an OECD country.

Despite the shadow economy functioning as a largely negative enterprise, the illicit and unofficial economy may have a positive effect on the official economy and GDP because the shadow economy drives growth when included in the official GDP. The Colombian average growth rate of real GDP per capita is 1.11% between 1976 and 2002, and the shadow economy explains an average of .02 percentage points of this growth.¹² These findings demonstrate that the real GDP per capita of Colombia grew instead of shrinking due to illicit activity. The shadow economy can help create new opportunities and support working families in Colombia, despite the generally negative rhetoric surrounding this form of employment. Between 1991 and 2015, the shadow economy of Colombia contributed on average 33.31% to the total GDP.¹³ This can explain why Colombia is still classified as a developing country despite its high GDP; Colombia's GDP is largely impacted by the shadow economy. There are great potentials and opportunities in the shadow economy but these growth opportunities cannot be fully used due to

¹¹ Schneider, September 2007

¹² Schneider, September 2007

¹³ Medina, Leandro and Schneider, Friedrich. "Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?" IMF Working Papers. International Monetary Fund, January 24, 2018. <https://www.imf.org/en/Publications/WP/Issues/2018/01/25/Shadow-Economies-Around-the-World-What-Did-We-Learn-Over-the-Last-20-Years-45583>.

the low overall productivity of shadow activities, restrictions on resources, and instances of violence connected to the shadow economy.

There are many implications of the shadow economy being a significant driver in Colombian currency demand. Returning to the controls in this research, the fact that the shadow economy drives currency demand positively influences public government confidence. As farmers are getting paid in cash for their involvement in illicit activities, their approval ratings for the Colombian government increase due to the relaxed regulations and taxation on these illicit activities. Additionally, the shadow economy influences an increasing Colombian GDP per capita, which in turn increases the public's confidence in the government. Schnieder and Hametner use the regression equation below to understand the growth of real "official" GDP per capita, denoted as GGDPPC, and the shadow economy's influence on this growth:

$$\ln GGDPPC_t = \beta_0 + \beta_1 \times \ln GGDPPC_{t-1} + \beta_2 \times IR_t + \beta_3 \times \ln DI_t + \beta_4 \times \ln FDI_t + \beta_5 \times \ln POP_t + \beta_6 \times SPC_t + \beta_7 \times LPA_t + \beta_8 \times PCGDP_t + \beta_9 \times SE_t + u_t$$

Where 'IR' denotes the inflation rate, 'DI' and 'FD'I denote domestic and foreign direct investments respectively, 'POP' denotes the size of the population, 'SPC' denotes human capital as average schooling years per capita, 'LPA' denotes the participation rate in the labor market, 'PCGDP' denotes public spending on consumption, and 'SE' denotes the size of the shadow economy.

This equation helps to derive the shadow economy's influence on GDP per capita as an increasing GDP per capita increases the positive indicator of the public's confidence in the government. In the past when the Colombian government increased the average net tax rate in Colombia, there is a spike of 3.8%¹⁴ in the currency demand per capita. This spike in currency demand can be attributed to an increase in illicit shadow economy activities because more people

¹⁴ Schnieder and Hametner

decide to be employed in the shadow economy because of increasing official tax rates. Another shadow economy factor contributing to Colombian currency demand is that a 1% increase in the revenues from the coca business raises Colombian cash demand by .1%, so as the coca business is rapidly growing the Colombian cash demand also grows.¹⁵

Various governments impacted by the Colombian shadow economy have begun to work together to prevent the growth of the Colombian role in narco-trafficking. The United States has worked with the Colombian government to increase the eradication efforts of coca crops in Colombia. The Colombian government has worked to eradicate coca crops through two major methods: aerial eradication and manual eradication. Aerial eradication uses a glyphosate coca-killing aerator sprayed through low-flying aircraft to eradicate Colombian coca plants while manual eradication simply involves government personnel traveling to agricultural hotspots and manually removing the coca plants. The government has primarily used aerial eradication efforts and has had some success; however, the method of aerial eradication destroys any plant it touches, including non-coca crops. Therefore, the aerial eradication method to stem the Colombian shadow economy has hurt its official economy as well. For example, there was a significant drop in the percentage of agriculture value added to the total Colombian GDP between 1999 and 2000 where the World Bank observed a drop of 13% to 8.3% of agriculture as a percentage of GDP in Colombia.¹⁶ This decline in the percentage of agricultural value added to the total Colombian GDP coincided with increased efforts of aerial spraying eradication of coca cultivation in Colombia. During the same period, the net cultivation of coca crops in Colombia increased by 1.88% between 1999 and 2000 while eradication efforts increased by 34.71%¹⁷

¹⁵ Schnieder and Enste

¹⁶ "Agriculture, forestry, and fishing, value added (% of GDP) - Colombia." World Bank Data. The World Bank, 2021. <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?end=2021&locations=CO&start=1965&view=chart>.

¹⁷ "Colombia - Coca Cultivation Survey." United Nations Office on Drugs and Crime and the Government of Colombia, June 2005. https://www.unodc.org/pdf/andean/Part3_Colombia.pdf.

These findings demonstrate a possible connection between the agriculture percentage of GDP and air eradication of coca in that the aerial eradication method has caused more harm as it damages other crops and decreases total Colombian GDP.

All researchers do not share the perspective that the shadow economy can be a positive aspect of total economic growth. For example, Schneider and Hametner believe that the Colombian shadow economy is harming the official economy because Colombian average growth in real GDP per capita was 1.86% between 1980 and 2012 and without the shadow economy the real GDP per capita could have been higher around .12 points on average.¹⁸ While this may be true, it is important to consider the biases that may lead these researchers to come to this conclusion. They might compare this growth to highly developed countries; however, the Colombian real GDP per capita grew nonetheless, and this growth is undoubtedly important in developing areas such as Central and South America. Additionally, the 1990s were a decade of economic restructuring in Colombia that showed positive effects on growth of GDP at the beginning of the 21st century, therefore these findings may be skewed considering the large levels of reform that took place during the data collection.

Understanding the role of the shadow economy in Colombia can be made easier by comparing it to Brazil. Brazil is fairly similar to Colombia in terms of periods of economic growth and development, though Brazil is a geographically and demographically larger country. In 2015,¹⁹ 35.22% of Brazil's GDP was generated by the shadow economy. To compare, in 2015 Colombia's percentage of GDP made up by the shadow economy was 25.25%.²⁰ To arrive at these conclusions, Medina and Schneider utilized the Predictive Mean Matching(PMM) method to estimate the size of the shadow economy country-by-country. This method accommodates for

¹⁸ Schneider and Enste

¹⁹ Medina and Schneider (2018)

²⁰ Medina and Schneider (2018)

missing information by compensating for the inherent uncertainty associated with a lack in data when estimating the size of a country's shadow economy, therefore it is the ideal method of estimation. The formula to find PMM is established using a linear regression and is as follows:

$$Y_{it} = \alpha + \beta_{ge0} * GE_0 + \beta_{rq} * RQ + \beta_c * C + \beta_{rol} * \beta * ROL + \beta_{bf} * BF + \beta_{se} * SE + \beta_{HDI} * HDI + \beta_E * E$$

“Where Y is the size of the shadow economy as a percentage of GDP, GE is a government effectiveness index, RQ is a regulatory quality index, C is a corruption index, ROL is a rule of law index, BF is a business freedom index, SE is self-employment levels, HDI is the Human Development Index, and E is an education variable,” according to Medina and Schneider.

Furthermore, Brazil serves as the median in Central and South American currency demand. In the 1990s, Brazil saw large spikes in currency demand with the height of narcotrafficking demanding more money in circulation. Colombia experienced similar spikes in currency demand, but there is a lack of official data for the late 1980s and early 1990s, likely because of lack of government regulation and a weak Colombian government in general. Both countries have seen gradual increases in currency demand in the 21st century though, and in Brazil 2020 was the largest increase in currency demand since 2003 at a 8.9% yearly increase in Brazilian Real circulation. This spike could be attributed to the pandemic and changing economic conditions given the circumstances, and could also be impacted by a rise in shadow economy levels globally as people looked to the informal economy to supplement their income during the tumultuous times of the pandemic. Likewise, in 2020 Colombia saw the largest increase in currency demand since 2011 with a 3.8% increase in Colombian peso circulation.²¹

²¹ “Broad Money Growth (Annual %) - Colombia.” The World Bank Data.

According to the IMF, Colombia is currently experiencing large levels of currency demand which may point towards an increase in shadow economy activities.

There are many ways to combat the shadow economy, though policy generally rests in governmental policy. Research suggests more frequent tax audits and heavier penalties for tax evasion, the legalization of certain shadow economy activities which can then liberalize the labor market, and reforms that make the economy more competitive that would also reduce incentives for corruption. The idea of reforms largely focuses on tax reforms. In Colombia, 58% of workers are employed informally and many of these people have low-paying, low-productivity jobs that are supported by shadow economy jobs.²² An optimal tax schedule for Colombia would have lower marginal rates at the bottom and higher rates elsewhere, which would allow taxes to increase the support of its lowest classes while keeping the same budget balance as the actual tax. Through these reforms, more people would work in the productive formal sector but the average labor income would fall because of returns to normal, formal taxation. According to Doligaski and Rojas's findings, the shadow economy should employ 30% of the Colombian workforce which is roughly half of the shadow economy employment in 2015 at the time of data collection. Additionally, Doligaski and Rojas propose that the share of the shadow income should be 5.24%, a drastic difference from the 2015 levels of 18.95%.²³ Research has found that shadow economies require reform through two-pillar strategies that work to slow down and/or reduce shadow economy activities.²⁴ The two-pillars work to reduce the attractiveness of the exit option from the formal economy – shadow economy – while strengthening the voice of the people through voting and government participation. The exit option focuses on how citizens

²² Doligalski, Paweł, and Luis E. Rojas. "Optimal Redistribution with a Shadow Economy." *Proceedings. Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association* 108 (2015): 1–41. <https://www.jstor.org/stable/90023169>.

²³ Doligaski and Rojas

²⁴ Enste, Dominik H. "The shadow economy in industrial countries." IZA: Institute of Labor Economics. IZA: World of Labor, November 2018. <https://wol.iza.org/articles/shadow-economy-in-industrial-countries/long>.

need more opportunities to participate in rule-making and the design of the tax system to create what they believe to be a fairer situation while reducing financial incentives to escape into the shadow economy. The voice option works to build trust in social capital while reducing centralization, focusing on reforms of institutions and systems, and increasing participation which then boosts tax morale and civic loyalty while further reducing the attractiveness of the shadow economy. Due to the breadth of the two-pillar strategy, it can be easier to reform a system that is already in place.

It is difficult to begin reforming a generally unstable government from the ground up, which is why Colombia should work to reform the 2015 Plan to Boost Productivity and Employment (PIPE) which works to generate investment in infrastructure with the ultimate plan to boost growth and development in Colombia.²⁵ This plan is working to promote competitiveness, control of contraband, cross-border trade, and more; however, it requires reform to account for long-term strategy and the coordination of different programs, such as tax reform programs. By reforming PIPE, Colombia can work to integrate some aspects of the shadow economy but primarily reduce illicit activity. Signs that the PIPE reforms are working will be noticed by changes in the shadow economy which can include a slowing cash demand, rising labor market participation rates, and working hours.²⁶ When labor market participation rates rise in the future due to PIPE reforms, this will be a key indicator that individuals have left the shadow economy to participate in the formal economy.

The impact of the shadow economy on the Colombian economy as a whole is clear, as is the impact of the shadow economy on currency demands, real GDP per capita, and government confidence. In Colombia, data suggests that the shadow economy is beneficial and can support

²⁵ “PIPE 2.0, the new investment opportunity in Colombia.” TMF Group. TMF Group, 23 June 2015. <https://www.tmf-group.com/en/news-insights/articles/2015/june/colombia-pipe-2/>.

²⁶ Schneider and Enste

the official economy, though there are many negative outcomes of the shadow economy such as violence and low productivity rates. Additionally, Colombia is still considered a developing country and by reducing the impact of the shadow economy on total GDP, it can garner further international support. To combat the shadow economy and its illicit impact on currency demands, real GDP per capita, and government confidence it is vital for Colombia to work to reform the PIPE program to boost growth and development.

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