Quantifying Venezuela's Destructive Conflict

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How much have sanctions, and other politically induced restrictions on economic activity, affected the Venezuelan economy? How much of the country's decline can be attributed to these causes, as opposed to the more standard causes of poor policies and external shocks? In this paper I offer a quantification of the effect of alternative causes. The bottom line is that around half of the country's economic contraction between 2012 and 2020 can be explained as a result of sanctions and other politically induced restrictions such as the withdrawal of government recognition.

Sanctions and oil production

Table 1 summarizes the diverse quantitative estimates of the effects of financial and oil sanctions on Venezuela's oil production produced in the literature. Since many of the works cited highlight the magnitudes of losses in terms of barrels of oil production and revenue lost, it is tempting to compare these magnitudes across estimates. However, as Table 1 shows, these methods have been applied to different samples in terms of time and sector coverage and in some cases estimate the impact of different events (e.g., financial vs. oil sanctions). Therefore, I also present a comparison across estimates in terms of the losses as a percent of pre-sanctions output and of the total observed decline in production over the sample studied.

The range of absolute decline attributable to sanctions ranges from 235 tbd to 1,012 tbd, with an associated value of $5.1-$22.1 bn in foregone revenues. If we use only national level estimates, the range narrows to 468-1,012 tbd ($10.2-$22.1bn). The estimated range of losses is also between 24% and 52% of pre-sanctions output. The median estimates of decline are 611tbd ($13.4bn) and 41% of pre-sanctions output.

What fraction of the collapse in the country's oil production can be attributed to sanctions, according to these estimates? The last two columns of Table 1 present two estimates of this ratio. The first one is the fraction of the post-sanctions decline attributable to sanctions. This produces a range of 37-104%, with a median value of 59%.[2] However, calculating only the post-sanctions ratios disregards the decline in production that occurred prior to sanctions, which obviously cannot be attributed to sanctions. The second of these columns includes the pre-sanctions decline since 2012 in the denominator, calculating the sanctions effect as a share of the total decline observed between 2012 and the end of the sample. This provides a range of 29-66% for the fraction of the decline attributable to sanctions, with a median of 40%.[3] Were we reasonably certain that the effects of sanctions have been completely internalized by the end of the sample, the latter range would be the more accurate calculation. Since all of these samples are truncated before the end

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[2] Estimates above 100% indicate a counterfactual in which oil production would have recovered in the absence of sanctions, possibly as a result of higher oil prices.

[3] We exclude the cross-country panel data estimates from this last calculation, which are the only estimates that focus only on the 2019 oil sanctions. To the extent that the aim of this exercise is to understand the relative weight of sanctions to non-sanctions influences on the production decline, then only estimates of the effect of all sanctions, which begin in 2017, can be used toe stablish that weight.

TABLE 1: SURVEY OF ESTIMATED IMPACT OF SANCTIONS OVER OIL PRODUCTION

Author	Event	Estimation tecnique	Sample	Period	Impact on oil production			
					Thousand barrels per day	% of initial output	% of post-sanctions decline	% of total decline
Rodríguez (2018)	2017 sanctions	Difference-in-differences with Colombia as a counterfactual	Whole country	August 2017 to August 2018	-468	-24,2%	67,2%	41,1%
Rodríguez (2019, this volume)	2017 sanctions	Differences-in-differences fixed effects regression on pairwise comparisons of Venezuela with 36 other oil-producing countries	Whole country	August 2017 to May 2019	-689	-35,6%	58,7%	42,6%
	2017 sanctions	Synthetic Control		August 2017 to December 2018	-797	-41,2%	104,3%	66,1%
	2019 sanctions	Cross-country Panel Data		January 2019 to December 2020	-572	-49,7%	79,5%	
					-594	-51,6%	82,5%	
Oliveros (2020)	2017 sanctions	Linear extrapolation, lower bound (2% MoM decline)	Whole country	July 2017 to July 2020	-597	-30,8%	37,2%	29,4%
		Linear extrapolation, mid range (1.5% MoM decline)			-786	-40,6%	49,0%	38,7%
		Linear extrapolation, upper bound (1% MoM decline)			-1.012	-52,3%	63,1%	49,8%
Equipo Anova (2021)	2017 sanctions	Regression Discountinuity Analysis	Whole country	August 2017 to December 2019	-698	-33,2%	58,5%	37,4%
Rodríguez (2022)	2017 sanctions	Difference-in-differences approach with firm-level data	Orinoco Basin SFVs	August 2017 to June 2020	-235	-41,4%	46,1%	42,0%
					-276	-48,5%	53,9%	49,3%
		Median estimates			**-597**	**-41,2%**	**58,7%**	**42,0%**

Source: Own Calculations based on cited sources.

of sanctions, then the true value is likely to be somewhere in the middle of these two ranges.[4] In my calculations, I use the midpoint between these two medians, 50.3%, as an estimate of the share of oil production decline attributable to sanctions.

In sum, empirical estimates of the effect of sanctions on Venezuelan oil output produce a broad range of effects. Depending on the method used, sanctions event, sample of study and period during which the decline is assessed, sanctions can explain between one-third and the totality of the observed decline. The central tendency of the estimates presented in Table 1 suggests that sanctions can explain around half of the decline in oil production.

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[4] To illustrate, suppose that production falls from 100 to 90 before the onset of sanctions, and then falls from 90 to 60 after sanctions are imposed. Assume that the pre-sanctions decline lasts 1 year and our data on the sanctions episode lasts two years. Were we to estimate that 100% of the post-sanctions decline is attributable to sanctions, then we would also conclude that 75% of the total decline is attributable to sanctions. But if sanctions were to continue for another two years after the end of our sample and continued to cause the same proportionate decline over time, then production would fall by another third, to 40, and the effect of sanctions on the total decline would be 83% instead of 75%. This point is particularly important because some of the estimates in Table 1 were truncated well before production bottomed out, suggesting that they only partially captured the impact of sanctions.

Concept	Cumulative percent decline, 2012-2020	Percentage contribution
Change in per capita GDP	-71.8%	100.0%
Oil GDP	-8.4%	11.7%
Sanctions effect	-4.2%	5.9%
Other causes	-4.2%	5.9%
Non-oil GDP	-63.7%	88.7%
Import capacity	-38.1%	53.0%
Oil exports	-34.8%	48.5%
Oil price	-14.5%	20.1%
Oil production	-20.4%	28.3%
Sanctions effect	-10.2%	14.3%
Other causes	-10.1%	14.1%
Permanent loss of access to credit	-3.2%	4.5%
TFP	-19.2%	26.8%
Sanctions and toxification effects	-14.9%	20.8%
Other causes	-4.3%	6.0%
Factor Accumulation	-6.4%	8.9%
Sanctions and toxification effects	-4.9%	6.9%
Other causes	-1.4%	2.0%
Aggregates		
Change in per capita GDP	**-71.8%**	**100.0%**
Sanctions and toxification effects	**-37.6%**	**52.3%**
Other causes	**-34.2%**	**47.7%**

Source: Own calculations

One of the main drivers of Venezuela's output decline was the reduction in the country's import capacity. This reduction was in turn caused by the decline in oil exports as well as the loss of access to international capital markets. Oil price declines account for around two-fifths of the decline in oil revenues, with declines in production accounting for the other three-fifths. If sanctions explain around half of the decline in oil production, that means that they explain roughly one-third of the total decline in oil revenues, with non-sanctions causes explaining the other two-thirds.

However, it is important to bear that although sanctions may explain one-third of the decline in oil revenues, that does not mean that they explain the same share of the decline in output. This is because the loss of access to international capital markets and the decline in productivity also affect output.

Estimating aggregate effects

I have argued elsewhere that Venezuela's economic collapse can be explained as a consequence of the adoption by political actors of strategies in their fight for power that generated severe negative economic externalities (Rodríguez, 2020; Rodríguez, 2023). Between 2012 and 2016, Maduro began to increasingly appeal to economic policy decisions with strong distortionary effects on the economy as a response to political incentives, including the holding of very frequent nationwide elections in a context of very high stakes of power and declining external revenues that made it increasingly difficult to satisfy the electorate in the same way in which Chávez had done during the oil price boom. After the opposition gained control of the National Assembly in 2016 and the support of the hawkish Trump administration in 2017, it began to seek ways to impede the government from having access to international financial and trade markets. It is this adoption by both sides of scorched earth strategies capable of inflicting severe damage on the economy, we argue, that is behind Venezuela's undergoing the largest output collapse ever documented outside of wartime.

In this section, I will try to provide a quantitative approximation of the effect of the adoption of some of these scorched earth strategies on the country's economy. Such an exercise, I feel compelled to warn at the outset, is indicative and suggestive at best. There are many channels through which political strategies can affect the economy, and

attempting to identify and quantify all of them can rapidly turn into an intractable exercise. How can we estimate, for example, the effect of the 2013 *Dakazo* (Maduro's accusation of price-gouging by retailers that led to looting and military take over o electronics stores) on private sector investment decisions? And how can we construct a reasonable counterfactual to indicate what price control policies would have been at the time in the absence of the political incentives generated by high stake of power and the proximity of the 2013 municipal elections? While there may be imaginative research designs that will allow us to answer these questions, it is inevitable that many of them will remain open at this stage of research.

I will therefore focus on three sources of what I argue are some of the most important politically driven causes of output decline. The first one is the decline in oil production caused by economic sanctions. The second one is the decline in access to external sources of funding caused by the withdrawal of recognition of the Maduro government. The third one is the decline in productivity that can be associated with the intensification of political conflict after 2016. It is important to note that these three impacts are far from a complete and exhaustive list of the economic distortions generated by the adoption of scorched earth strategies by political actors. My estimates should thus be read as a conservative lower bound for the effect of politically induced distortions on the country's economic growth. Table 2 summarizes our estimates of these effects.

Consider first the effect of economic sanctions on oil output. I surveyed a set of alternative estimates of the contribution of sanctions to the reduction in oil output in Table 1, and showed that the median estimate of the decline in output was equal to 42.0% of the post-2012 decline in production and 58.7% of the post-sanctions decline in production; given the truncation of sanctions effects at the end of sample at these studies, the midpoint between these two estimates offers a reasonable approximation to the effect of sanctions on oil production. I thus attribute 50.3% of the decline in oil output to sanctions.

The sanctions-induced decline in oil output affects GDP through two channels. First, since oil accounted for 11% of GDP prior to the collapse, there is a direct contribution of the sanctions to the GDP decline through reduced oil output. This represents a loss of 4.3 percentage points of initial (2012) GDP. Second, there is an indirect effect through the losses in non-oil GDP caused by reduced import capacity. In other work, we estimate that reduced import capacity can explain 59.8% of the decline in GDP.[5] Applying this ratio to non-oil GDP, I conclude that 38.1 percentage points of the GDP decline is due to loss in import capacity.[6] Of this, around three-fifths is due to lower production, with the other two-fifths due to price declines, implying that an additional 10.2 percentage points of the loss of GDP can be attributed to reduced import capacity caused by sanctions.[7]

I propose to quantify the politically induced loss of access to credit by considering three sources of funding that the country would have surely made use of had it been able to. These are the Special Drawing Rights issued by the IMF in its 2021 general allocation, which were valued at $5.0 bn, the IMF's non -program Rapid Financing Instrument facility, which would have given the country access to 150% of its IMF quota, or $7.8bn, and its central bank gold and other reserve assets blocked at the Bank of England, valued at $2.1bn. I assume that in 2020 the country would have spent one-third of these assets in higher imports. Using again the estimated contribution of reduced import capacity to GDP of 59.8%, this means that the politically induced loss of access to external funding sources accounts for a loss of 3.2% points of GDP.

Last, I address the effects of sanctions on total factor productivity. Productivity affects GDP both directly and indirectly by inducing changes in factor accumulation. I use the difference between the post-2016 decline in productivity (15.4% annual) and the 1999-2016 decline in productivity (1.7%) to estimate the share of productivity in the 2017-20 period that is attributable to sanctions and other politically induced toxification effects. I assume that all of the decline

[5] Rodríguez, F. (2021). Toxic conflict: understanding Venezuela's economic collapse. Kellogg Institute for international studies.
[6] As we have only have capital stock – and therefore productivity- estimates for the whole economy, we assume that this ratio applies equally to oil and non-oil GDP.
[7] We use the average price and imports of 2019-2021 for these calculations.

in productivity in 2012-16 is due to causes other than sanctions and toxification. This delivers an estimate of 14.9 percentage points of 2012 GDP being attributable to the direct effect of sanctions and toxification on productivity, with another 4.9 percent attributable to the indirect effects through factor accumulation.

The sum of all of these effects is 37.6 percent of 2012 GDP, or 52.3 percent of the decline in output observed in the 2012-20 period. Of this loss, 53% is attributable to direct and indirect productivity effects, 38 percent to sanctions effects on oil production, and 9 percent to loss of access to external funding sources. It is worth emphasizing that this is most likely to be a lower bound approximation. For example, it is almost certain that if the country had not lost access to international capital markets, it would have been able to fund higher imports through borrowing by much more than one-third of its access to IMF funds and reserve assets blocked in the UK. The inherent uncertainty about the possible access to funding sources other than those forces us to adopt a conservative estimate of this effect.

The numerical approximation offered in this section thus suggests that approximately half of the decline in GDP observed in Venezuela between 2012 and 2020 can be attributed to politically induced causes, including economic sanctions, the loss of access to external funding sources, and the politically induced toxification of relations with the Venezuelan economy. One way to think about this number is by noting that it implies that in the absence of these economic effects of political conflict, Venezuela's economy would have contracted by 34.2 percent in the 2012-20 period. Such a contraction would have been more in line with the magnitude of other large contractions in developing countries, as well as in past Venezuelan history, induced by a combination of external shocks with prior unsustainable macroeconomic policies.

In other words, if we ask how much of Venezuela's economic contraction between 2012 and 2020 can be attributed to the country's economically destructive political conflict, the results of this section suggest that the answer is around half. But if we ask why Venezuela suffered such an unusually large collapse, a good case can be made that the sole cause is the country's descent into economically destructive political conflict. Had it not been for the adoption of scorched earth tactics that led to the severing of the country's trade and financial links with the global economy, then Venezuela would have certainly undergone a major economic crisis after the collapse in oil prices. Not only would that crisis have been much smaller than what we observed; it would also not have been atypical given the magnitude of the terms-of-trade decline and the country's exposure to external shocks due to its high oil dependence. Had Venezuela's income declined by around a third after seeing a fall of more than two-thirds in oil prices, not many observes would have considered the result unusual. The fact that Venezuela suffered an economic collapse of a much greater order of magnitude than that is what makes the country's experience atypical. The country's excess contraction over and above what would have typically been the response to a large negative terms of trade shock cannot be explained without bringing in the phenomenon of economically destructive political conflict.

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