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VIRTUAL DIGITAL ASSET TAX ARCHITECTURE IN INDIA:
A CRITICAL EXAMINATION

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Esya Centre
B-40 First Floor
Soami Nagar South,
New Delhi - 110017, India

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Author: Dr. Vikash Gautam is an *Adjunct Fellow* at the Esya Centre.

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HIGHLIGHTS

1. **This is the first empirical exercise to estimate the impact of India's tax policy on centralised Virtual Digital Asset (VDA) exchanges, that are similar to stock exchanges for digital assets. We find that the main (unintended) impact of the policy is the offshoring of domestic business and liquidity to foreign exchanges. Therefore, we anticipate a commensurately large negative impact on tax revenues, as well as a decrease in transaction traceability – which defeats the two central goals of the extant policy architecture.**

2. **To wit, there was a shift of cumulative trade volume of around USD 3,852 million (~INR 32 thousand crores) from domestic centralised VDA exchanges to foreign ones, during Feb-Oct 2022, following the announcement of a new tax regime in India.[i] Of this, cumulative volume of USD 3,055 million (~INR 25.3 thousand crores) was offshored within six months of the current financial year.**

3. **Additionally, according to a sample of 5436 peer to peer traders and industry estimates, the total trade volume contributed by Indians on foreign centralised VDA exchanges was to the tune of USD 9,670 million (INR 80 thousand crores) between Jul and Oct 2022. This unique channel of trade and method of estimation is discussed in more depth later in this report.**

4. Domestic centralised VDA exchanges lost 15 percent of their trading volumes in the two months (i.e. Feb-Mar 2022), following the Union Budget 2022 announcement of a levy of 30 percent tax on gains, no provision to write-off losses and one percent TDS. They lost another 14 percent of their trading volumes in three months (i.e. Apr-Jun 2022), since the implementation of the flat 30 percent tax. And finally, the implementation of the one percent TDS has had the most distortionary impact out of the three tax measures/events, as Indian VDA exchanges lost up to 81 percent of their trading volumes in four months (i.e. Jul-Oct 2022) following the levy.

5. Many Indian VDA users seem to be switching from domestic centralised VDA exchanges to foreign counterparts (an estimated 17 lakh users switched in the period analysed), a trend visible starting Feb 2022 (i.e. following

i. Exchange rates as applicable on 31st October 2022

from the Union Budget announcement). Alternatively, VDA adoption by Indians as measured by mobile app downloads fell by a sizable 16 percent on month-on-month basis for domestic exchanges, while increasing by the same amount for foreign exchanges, during Jul-Sep 2022.

6. India's tax treatment of VDAs is regressive in comparison to other countries with high VDA adoption rates, such as the USA, UK, South Africa, Vietnam, Philippines and Brazil. We recommend the following design changes, in order to mitigate the ill-effects of the current VDA tax architecture:

   - **Given that the TDS mandate is also meant to enhance transaction tracking, lower its rate, akin to the securities transaction tax (STT). This will help curb the distortionary effect of TDS on the industry;**

   - **The government should reconcile tax rates vis-a-vis revenue maximization by ascertaining the optimal taxation point(s) through Laffer-Curve analysis;**

   - **Therefore, the government should adopt a progressive tax structure with differentiated rates for short term and long-term gains, in line with international best-practice;**

   - **In addition to tax measures, the high volumes of P2P trade suggest that India will also need to enhance international coordination as well as institutional oversight on VDA exchanges, such as a licensing scheme.**

7. Finally, the current tax architecture may lead to a loss of approximately USD 1.2 trillion (INR 99.3 lakh crores) of local exchange trade volume in the next four years, relative to a pro-market scenario where (a) TDS on VDAs is at par with that on securities; (b) tax policy allows the provision to setoff losses; (c) taxation of gains from VDAs is internationally competitive.

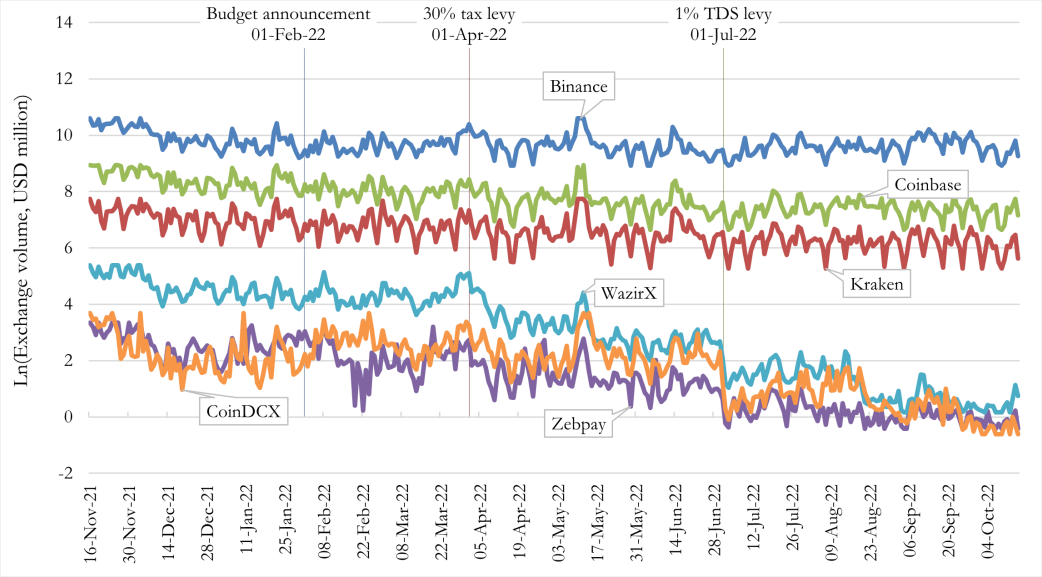
1. INTRODUCTION

We examine the impact of three events on the centralised virtual digital asset (VDA) industry in India, announced on 1st February 2022 during the Union Budget 2022-23: (a) a levy of a flat 30 percent tax on gains from VDA trade applicable from 1st April 2022; (b) a levy of 1 percent tax deducted at source (TDS) on transactions above INR 10,000 from 1st July 2022; and (c) the provision disallowing the offsetting of losses applicable from 1st April 2022s. This policy stance is intended to achieve a threefold objective: tracking VDA transactions by resident Indians and the corresponding sources of income; discouraging speculation and trading on VDAs; and building guard rails for financial stability (ToI, 2022; Economic Times, 2022).

While the government's intention to improve VDA transparency and consequent macroeconomic stability is an optimistic move, many experts argue that extant VDA taxation architecture defeats this purpose (Economic Times, 2022). The TDS rate disincentivizes Indian market participants to operate through centralised domestic exchanges, in favour of foreign counterparts (Indian Express, 2022). Figure 1 presents this case, and depicts the volumes of three leading centralised Indian VDA exchanges vis-à-vis those of centralised foreign exchanges that don't have local operations.[ii] There is a notable fall in the volumes of each of the three Indian VDA exchanges at the relevant regulatory inflexion points/events. There is also a secular fall from the Budget announcement (i.e., 1 Feb 2022) to the levy of one percent TDS on VDAs (1 Jul 2022).

ii. Binance, CoinBase and Kraken are three largest global centralised VDA exchanges, which do not have operations in India. CoinDCX, WazirX and Zebpay three largest Indian centralised VDA exchanges.

Figure 1: Centralised VDA Exchange Volumes



Notes: The sample includes data on three Indian centralised VDA exchanges - WazirX, CoinDCX and Zebpay, and three foreign centralised VDA exchanges – Binance, Coinbase and Kraken. The sample period is between 16 Nov 2021 and 15 Oct 2022. This figure presents natural log transformed volumes of the exchanges.
Source: CoinGecko.

Therefore, we assess the impact of the current tax architecture on the VDA market and suggest ways to attain welfare-improving scenarios. We adopt a four-pronged approach. First, we examine the competitiveness of Indian VDA tax architecture with that of several other countries. In this regard, we focus on three parameters, viz. tax rate on short-term and long-term gains, TDS, and provisions to setoff losses. Second, we estimate the impact of the regulatory events (i.e. Budget announcement, levy of 30 percent tax on gains and levy of one percent TDS) on volumes of Indian centralised VDA exchanges, using a causal estimation method a. la. Athey and Imbens (2006). Third, we examine monthly data on Indian users' traction on domestic and foreign exchanges to gather additional evidence on the impact of the regulatory events on the VDA market. Finally, we estimate the quantum of volume that has shifted flow from Indian centralised VDA exchanges to their foreign counterparts as a consequence of the regulatory events.

There is no empirical evidence on the impact of Indian VDA tax architecture on the market in the existing literature. Our research aims to fill this gap in policy research. We highlight five key results: (a) India's tax-policy on VDAs is the most regressive in comparison to the other countries that have high levels of VDA adoption; (b) Implementation of the TDS has had the most

distortionary impact of all, with Indian centralised VDA exchanges losing nearly 81 percent of their trading volumes in four months (i.e. Jul-Oct 2022) following the levy; (c) Indian investors switched from Indian centralised VDA exchanges to foreign counterparts on a large scale (in excess of 17 lakhs during Feb-Oct 2022) following from these regulatory events; (d) nearly USD 3,852 million worth of cumulative volume moved from Indian centralised VDA exchanges to foreign ones during Feb-Oct 2022, Of this, USD 3,055 million was offshored within six months of the current financial year; and (e) the current tax architecture will result in lost cumulative trade volumes of USD 1.2 trillion in the next four years. We recommend strategies to offset these unintended ill-effects.

2. DATA AND METHODOLOGY

We use public and private sector reports for tax rate data on short-term (i.e., less than a year) and long-term (i.e., more than a year) gains, the applicability of TDS, and provision to setoff losses for deriving taxable income. We compare India with countries that have high VDA adoption rates along these three parameters. These include the US, UK, Canada, Ukraine, Brazil, Thailand, Japan, Austria, Singapore, Malaysia, South Africa, Netherlands, Switzerland, Vietnam and Philippines (Chainalysis, 2022). We use data on three Indian exchanges and three foreign exchanges from CoinGecko, to estimate the impact of regulatory events (i.e., Budget announcement, levy of 30 percent tax on gains and levy of one percent TDS) on market volumes of VDA exchanges.[iii] We employ the change-in-change (CIC) estimation method *a. al.* Athey and Imbens (2006) to assess the impact of the VDA taxation events on exchange volumes. We look at Indian users' online traffic on centralised VDA exchanges from the 'SE Ranking' database. The Annexure provides a brief on the methods used on this report.

We use two manoeuvres on data. First, exchange volume data is available at a daily frequency till 15 Oct 2022, while users' online traffic data is available at a monthly frequency. We multiply the former with 31/15 in order to derive consistent monthly estimates. Second, volume data at VDA exchanges, intelligence platforms and media reports suggest that the three domestic exchanges in the sample (WazirX, CoinDCX and Zebpay) account for two-third of the total volume of Indian centralised VDA exchanges. On the other hand, the three foreign exchanges in the sample (Binance, Coinbase and Kraken) account for 80 percent of the total volume of foreign centralised VDA exchanges. We use these weights to derive market-wide statistics.

iii. CoinGecko is frequently cited by Forbes, the Wall Street Journal and the CNBC, and others. Binance, CoinBase and Kraken are the leading three global VDA exchange platforms in terms of trading volume (CoinGecko, n.d.) – and while CoinBase has an Indian office, it does not yet have local operations. CoinDCX is India's first cryptocurrency unicorn with a valuation of over USD 2.15 billion and over 10 million users (ForbesIndia, 2022; TechCrunch, 2022). WazirX and Zebpay are other prominent Indian VDA exchanges with user bases of over 10 million and over 4 million, respectively (WazirX, n.d.; Business Standard, 2022).

3. INDIAN VDA TAX COMPETITIVENESS VIS-À-VIS OTHER COUNTRIES

Table 1 presents a comparative picture of the regulatory stance on VDA taxation in India vis-à-vis that in other countries. The following inferences emerge:

A. **Tax on gains from VDA trading** – Most countries have a progressive tax structure either on trade gains or on the value held at the end of the financial year. For example, the US taxes short-term and long-term gains from VDA at separate rates. While short-term gains are taxed at a rate between 10-37 percent, long-term gains attract a lower tax rate of 10-20 percent. On the contrary, India's flat tax approach which is akin to its taxation on winnings from gambling and betting, is a disincentive for VDA traders, especially small investors (Financial Express, 2022).

Importantly, even though the tax rate ceiling of 37 percent in case of the US is higher than that in India, tax burden of a rate higher than 24 percent falls only on short-term traders with gains above USD 170,050, which impacts the wealthiest four percent population in the country (World Inequality Database, n.d.). Similarly, in case of the UK, Canada, Japan, South Africa and Philippines, the tax rate above 30 percent impacts only on a small fraction of high-income traders (World Inequality Database, n.d.).

B. **One percent TDS on VDA transactions** – None of the countries, except India, impose a TDS on VDA transactions. A TDS of one percent (on transactions above INR 10,000) is quite high for an industry characterised by high-frequency transactions akin to securities markets. In contrast to the Indian case, several countries have internal mechanisms to track VDA transactions to ensure tax compliance. For example, the Canada Revenue Agency (CRA), USA and UK have collaborated with centralized VDA exchanges to obtain investor information for VDA investment tracking without impacting market liquidity.

C. **Provision for offsetting losses** – India does not allow offsetting of losses which acts as a disincentive as trading risks cannot be hedged

against profits. Most other countries analysed here allow offsetting of losses except Brazil and Japan. While Brazil offers gains up to USD 7,300 per month as tax free and has a lower tax rate, Japan includes gains from VDA as taxable income.

Overall, India's VDA tax architecture is the most stringent across countries covered in Table 1. This leads to several unfavourable implications:

- **The tax regime creates a binding disincentive for Indian VDA traders, more so for the small traders, forcing them to offshore their liquidity. This renders the tax stance counterproductive.**
- **Regulatory uncertainty in the fledgling VDA industry also has the potential to lead to capital outflow, deter international investors, or streamline investments towards vertical markets. This reduces the competitiveness of Indian VDA exchanges relative to their international counterparts to attract investments in this space.**
- **A flat high tax rate may not be optimal to maximize tax revenues from the industry as it indirectly prompts investors to evade tax through increased peer to peer (P2P) and grey market trading. This reduces the transparency of VDA transactions and poses greater risks to financial stability.**

Table 1: VDA Tax Structure across Countries

COUNTRIES	ASSET CLASSIFICATION FOR TAXATION	TAX RATE/ BRACKET, PERCENT		TDS APPLICABILITY	PROVISION TO SET-OFF LOSSES
		LONG TERM GAINS/ INCOME	SHORT TERM GAINS		
India	Capital Asset	30	30	Yes (1%)	No
USA	Property	0-20	10-37; gains over USD 170,050 taxed above 24 percent.[iv]	No	Yes

iv. Top 4 percent of individuals earn above USD 170,050 annually in the United States.

COUNTRIES	ASSET CLASSIFICATION FOR TAXATION	TAX RATE/ BRACKET, PERCENT		TDS APPLICABILITY	PROVISION TO SET-OFF LOSSES
		LONG TERM GAINS/ INCOME	SHORT TERM GAINS		
UK	Virtual Asset	0-20, on capital gains above GBP 12,300 Tax free allowance; 0-45 income tax; For taxable income up to GBP 50,000, 20 percent tax levied.[v]		No	Yes
Switzerland	Asset/Property	0.3-1% (wealth tax on capital gains)	No tax, gifting tax-(2-36)	No	Yes[vi]
Canada	Commodity	15-33 (based on classification as income or capital gain); For taxable income up to $155,625, rate below 30 [vii]		No	Yes
Ukraine	Business Activity	5	5	No	-
Brazil	Securities	15-22.5 taxed as capital gains	0 under USD 7300 p.m., otherwise taxed under capital gains	No	No
Thailand	Digital Asset	8	8	No	Yes
Japan	Miscellaneous Income	0-55 under income tax brackets; For taxable income up to ¥9,000,000, rate is below 33.[viii]		No	No

v. Top 10 percent earn above GBP 50,270 annually in the United Kingdom.

vi. Because VDA gains are tax exempt for private investors, one cannot deduct VDA capital losses. However, if one qualifies as a self-employed trader or a business, they may be able to deduct VDA capital losses to reduce their tax bill.

vii. Less than top 5 percent of income earners in Canada fall in brackets above the 30 percent tax rate.

viii. Top 10 percent of the income earners fall under the tax slab above 33 percent, subject to deductions on taxable income.

COUNTRIES	ASSET CLASSIFICATION FOR TAXATION	TAX RATE/ BRACKET, PERCENT		TDS APPLICABILITY	PROVISION TO SET-OFF LOSSES
		LONG TERM GAINS/ INCOME	SHORT TERM GAINS		
Austria	Capital Assets	27.5	27.5	No	Yes
Singapore	Property	Tax free (non-business use)		No	Yes
Malaysia	Securities	Tax free	Active trading subject to tax similar to stocks; 0-24	No	Yes
South Africa	Financial Product	18 percent on capital gains, 18-45 percent on income tax brackets; For taxable income up to R 488,700 rate is below 30 percent.[ix]		No	Yes
Netherlands	Asset	1.9 -5.7 (Net worth tax- taxed on asset value)		No	Yes
Vietnam	Payment means/ goods/securities	0-5	5-10	No	Yes
Philippines	Virtual Asset/ Legal Tender	0-35 under income tax brackets, For taxable income up to PHP 2,000,000, rate is below 30 percent.[x]		No	Yes

ix. Less than top ten percent of income earners in South Africa fall in brackets above the 31 percent income tax rate.

x. Less than top two percent of income earners in Philippines fall in brackets above the 30 percent income tax rate.

4. CENTRALISED VDA EXCHANGE VOLUMES

Table 2 presents a comparative picture of Indian centralised VDA exchanges with that of comparable foreign VDA exchanges. Two key observations emerge:

- **Volumes of Indian VDA exchanges were 0.57 percent of that of the foreign VDA exchanges in Jan 2022. They fell to a stark 0.03 percent in Oct 2022.**
- **Indian VDA exchanges lost 97.1 percent of their volume in Oct 2022 when compared to the corresponding volumes in Jan 2022. In this period, foreign exchanges lost only 36.3 percent.**

Table 2: Centralised VDA Exchange Volumes

VARIABLE	PERIOD	INDIAN EXCHANGES	FOREIGN EXCHANGES	INDIAN EXCHANGES AS PERCENT OF FOREIGN EXCHANGES
Exchange volume, USD million	Jan 2022	4736.7	834,603.1	0.57
Exchange volume, USD million	Oct 2022	137.6	531,553.4	0.03
Exchange volume loss, percent	**Jan-Oct 2022**	**97.1**	**36.3**	

Source: Author calculation based on CoinGecko data.

This suggests that 60.8 percent of the fall in the volumes of Indian centralised VDA exchanges are due to domestic market conditions (i.e. VDA tax architecture in India during Feb-Oct 2022) and the conditions intrinsic to these exchanges. We turn to estimating the causal impact of these tax announcements/levies on exchange volume in the following section, given that there is a fall in volumes of both domestic and foreign centralised exchanges, with the former fall of a much higher magnitude.

5. IMPACT OF TAX ARCHITECTURE ON CENTRALISED VDA EXCHANGE VOLUMES

Table 3 presents the estimates of the impact of the three events – Budget announcement, levy of 30 percent tax on gains, one percent TDS and provision disallowing offsetting of losses – on market volumes. Three observations emerge:

- **Centralised Indian VDA exchanges lost 15 percent of their trading volumes in two months (i.e. Feb-Mar 2022) after Budget announcement on levy of 30 percent tax on gains and one percent TDS;**
- **These exchanges lost another 14 percent of their trading volumes in three months (i.e. Apr-Jun 2022) after 30 percent tax on gains was levied;**
- **They lost 81 percent of their trading volumes in four months (i.e. Jul-Oct 2022) after one percent TDS was levied.**

Table 3: Impact of Tax Events on Indian Centralised VDA Exchange Volumes

PERIOD	FEB-MAR 2022	APR-JUN 2022	JUL-OCT 2022
Exchange volume, USD million	9126	5991	1221
Loss by exchanges in the sample, USD million	**1374**	**824**	**988**
Loss as a percentage of exchange volume	**15**	**14**	**81**

Source: Author calculation based on CoinGecko data.

It is important to highlight two issues at this stage. First, many Indian VDA investors are likely to adjust their market behaviour right after the Union Budget announcement, anticipating the effect of the levies (i.e., 30 percent tax on gains and one percent TDS). Thus, this announcement effect is a part of

the overall impact of these levies. Second, to the extent Indian VDA investors are adaptive or/and their expectations do not fully account for the effect of future developments, the market will reveal corrections on days succeeding these events as well. We notice spikes in the impacts in the periods post these levies.

A significant negative impact of the current tax architecture on the centralised VDA exchanges prompts a pertinent policy question. That is, where does the crowded-out liquidity from the Indian VDA exchanges, due to the current tax architecture, end up? If investors channel their activities offshore, the Indian VDA tax design is counterproductive. Ready evidence on this is elusive, as it is almost impossible to track such an information. A feasible solution is to find a proxy for investors' engagements with foreign centralised VDA exchanges relative to the Indian ones. We discuss this in the following section.

6. TRACTION OF INDIAN USERS ON INDIAN AND FOREIGN VDA EXCHANGES

We look at online traffic from India towards the same six centralized exchanges. We use six-month moving-average for extracting trends from this data. Chatfield and Xing (2019) discuss the use of moving-average smoothers for extracting trends in detail.

Figure 2/ Table 4 shows the smoothed online traffic from India to foreign and domestic centralised VDA exchanges, at a monthly frequency. **Starting Feb 2022, there is clear evidence of foreign centralised VDA exchanges gaining traction, at the cost of Indian centralised VDA exchanges. That is, there is robust evidence that many Indian investors switched (approximately 17 lakhs if share of Indian users on Indian exchange remain as before Feb 2022), as a result of the domestic VDA tax architecture.** Using an alternate data on VDA adoption rate, proxied by number of app instals of domestic centralised VDA exchanges by Indians, we notice a month-on-month fall of 16 percent during Jul-Sep 2022, while downloads of foreign counterparts increased by a commensurate amount (source: Appannie, n.d.).

Figure 2: Online Traffic from India into Foreign and Domestic Centralised VDA Exchanges

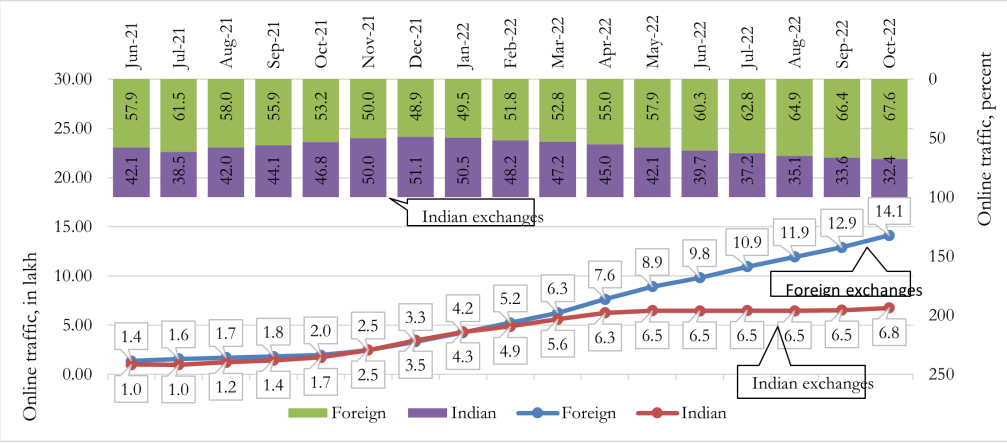


Table 4: Online Traffic from India into Foreign and Domestic Centralised VDA Exchanges

PERIOD	FOREIGN EXCHANGES				INDIAN EXCHANGES				INDIAN EXCHANGES MINUS FOREIGN EXCHANGES	
	NUMBER, IN LAKHS	GROWTH IN NUMBER, PERCENT	SHARE IN TOTAL, PERCENT	CHANGE IN SHARE	NUMBER, IN LAKHS	GROWTH IN NUMBER, PERCENT	SHARE IN TOTAL, PERCENT	CHANGE IN SHARE	GROWTH IN NUMBER, PERCENT	CHANGE IN SHARE
Nov-21	2.48	26.1	50.0	-3.2	2.47	43.5	50.0	3.2	17.4	6.4
Dec-21	3.32	34.0	48.9	-1.1	3.47	40.1	51.1	1.1	6.1	2.2
Jan-22	4.24	27.8	49.5	0.6	4.33	24.8	50.5	-0.6	-3	-1.2
Feb-22	5.24	23.5	51.8	2.3	4.88	12.7	48.2	-2.3	**-10.8**	**-4.6**
Mar-22	6.26	19.6	52.8	1.0	5.59	14.7	47.2	-1.0	**-4.9**	**-2.0**
Apr-22	7.64	22.0	55.0	2.2	6.25	11.8	45.0	-2.2	**-10.2**	**-4.4**
May-22	8.91	16.7	57.9	2.9	6.48	3.6	42.1	-2.9	**-13.1**	**-5.8**
Jun-22	9.82	10.2	60.3	2.4	6.47	-0.1	39.7	-2.4	**-10.3**	**-4.8**
Jul-22	10.94	11.5	62.8	2.5	6.49	0.3	37.2	-2.5	**-11.2**	**-5.0**
Aug-22	11.95	9.2	64.9	2.1	6.46	-0.5	35.1	-2.1	**-9.7**	**-4.2**
Sep-22	12.90	8.0	66.4	1.5	6.54	1.3	33.6	-1.5	**-6.7**	**-3.0**
Oct-22	14.12	9.4	67.6	1.2	6.76	3.4	32.4	-1.2	**-6.0**	**-2.4**

Source: SE Ranking.

How Offshoring Happens: Case Study on P2P Transactions

Peer-to-Peer trades mediated by offshore VDA platforms have emerged as a convenient and difficult-to-trace option for VDA traders, including in India. Specifically, they can transact INR directly between each other's bank accounts, while a third party VDA exchange facilitates the transfer of VDA between internal wallets. We use a sample of 5436 P2P traders posting P2P advertisements on prominent offshore exchanges covering 10 VDAs, to assess the P2P INR volumes on offshore exchanges.[xi] These were collected in November 2022.

In summary:

- Average 30-day volume: USD 366mn
- Average completion rate across sample: 92 percent
- Average 30-day orders: 1,416,392
- Average trade size: USD 254
- Total number of advertisers active during the period: 5436

Clearly, some Indian users entered and exited the VDA market through cash transactions while using offshore platforms to trade and store their funds. As a result, they traded an average USD 366 mn on average per day. We surveyed industry experts in two leading domestic exchanges with these summary results based on P2P volumes, who subsequently pegged the total trade volume loss at USD 9,670 million from July till October 2022.

xi. Data was scraped from the p2p product offerings of offshore exchange platforms; it was collected for 10 assets – ADA, BNB, BTC, BUSD, SHIB, ETH, MATIC, TRX, USDT & WRX

7. VOLUME SHIFT FROM INDIAN TO FOREIGN CENTRALISED VDA EXCHANGES

The assessment of online traffic and volume data in the previous sections indicates that there are two effects in play for liquidity flows from Indian to foreign centralised VDA exchanges: (a) **substitution effect**: there is a shift in traffic from Indian to foreign centralised VDA exchanges, out of the total number of Indians who traded through either of these kinds of exchanges; (b) **growth effect**: the total traffic from India to VDA exchanges, domestic or foreign, would have grown differently had there been no change in the tax policy stance. Foreign centralised VDA exchanges account for part of this growth in traffic.

Table 5 presents estimates of trade volume flight from from Indian to foreign centralised VDA exchanges. Algorithm for these estimates is in the Annexure. Three key inferences emerge.

- **Cumulative trade volume amounting to USD 797.2 million moved from Indian to foreign centralised VDA exchanges during Feb-Mar 2022. It accounts for 8.7 percent of the volume of the Indian centralised VDA exchanges in this period;**
- **Additional cumulative trade volume worth USD 2206.4 million shifted from Indian to foreign centralised VDA exchanges during Apr-Jun 2022, accounting for 36.8 percent of the volume of the Indian centralised VDA exchanges in this period;**
- **In the next four months during, Jul-Oct 2022, cumulative trade volume worth USD 848.6 million shifted from Indian to foreign centralised VDA exchanges. It accounts for 69.5 percent of the volume of the Indian centralised VDA exchanges in this period.**

Table 5: Shift in Trade Volume from Indian to foreign centralised VDA exchanges

PERIOD	FEB-MAR 2022	APR-JUN 2022	JUL-OCT 2022
Exchange volume, USD million	9126.0	5991.0	1220.6
Indian online traffic to domestic centralised VDA exchanges, million	1.05	1.3	2.6
Indian online traffic to foreign centralised VDA exchanges, million	1.1	2.6	3.8
Substitution effect: Cumulative trade volume flight from Indian to foreign centralised VDA exchanges, USD million	543.9	1792.2	568.0
Growth effect: cumulative trade volume flight from Indian to foreign centralised VDA exchanges, USD million	253.3	414.2	280.5
Total: Shift of cumulative trade volume from Indian to foreign centralised VDA exchanges, USD million	**797.2**	**2206.4**	**848.6**
Trade volume going to foreign exchanges, as a percent of total trade volume	**8.7**	**36.8**	**69.5**

Source: Author calculation based on CoinGecko and SE ranking data.

Overall, around USD 3,852 million worth of cumulative trade volume that would have taken place on domestic centralised VDA exchanges shifted to foreign ones due to the slanting tax policy in the country. Of this, USD 3,055 million was offshored within six months of the current financial year.

8. SCENARIO-BASED FUTURE PROJECTIONS

The Indian VDA industry is crippled under the current tax architecture. It is imperative to assess future prospects with current baseline scenario vis-à-vis a more pro-market scenario. Based on the discussion so far, we lay out these two scenarios below:

- **Baseline Scenario:** (a) Almost all Indian centralised VDA users move to foreign exchanges; (B) Local exchanges continue to lose volume and user traction, in the same way as they have Feb '22 onwards.

  The result of this scenario is that centralised exchange businesses become unviable in India.

- **Pro-market scenario**: (a) TDS on VDAs is at par with that on securities (assuming the maximum rate of 0.1 percent TDS); (b) tax regulations allow the setoff of losses; (c) taxes on gains are internationally competitive (i.e. it is progressive).

  The result of this scenario is that volumes and growth of Indian centralised VDA exchanges return to pre-Budget 2022 levels in two quarters; and domestic centralised exchanges receive 50.5 percent of traction from Indian users on an average (as was the case before the Budget announcement).

Table 5 presents the baseline and pro-market scenarios for centralised VDA exchange volumes. **The current tax architecture may lead to a loss of approximately USD 1.2 trillion of local exchange trade volume in the next four years, relative to a pro-market scenario.** The methods for these estimates is in the Annexure.

Table 6: Baseline and Pro-Market Scenarios for Centralised VDA Market

TIME	CURRENT/PRO-MARKET SCENARIO	VOLUME, USD MN	RELATIVE TO NOV 2021
Nov-21	**Current market scenario – actual exchange volume**	7781.2	X
Feb-22		2800.1	0.41X
Mar-22		3288.7	0.36X
Apr-22		1862.2	0.42X
May-22		1348.5	0.24X
Jun-22		795.8	0.17X
Jul-22		286.6	0.1X
Aug-22		242.0	0.04X
Sep-22		131.8	0.03X
Oct-22		91.8	0.02X
Nov-22	**Pro-market scenario – potential exchange volume**	4455.1	0.57X
Nov-23		10542.7	1.35X
Nov-24		16630.3	2.14X
Nov-25		22717.9	2.92X
Nov-26		28805.5	3.70X

Notes: The sample for this projection includes data on three Indian VDA exchanges - WazirX, CoinDCX and Zebpay, and three foreign exchanges – Binance, Coinbase and Kraken. The algorithm and assumptions for the future projections are in the Annexure.

9. CONCLUSION AND RECOMMENDATIONS

On one hand, the tax on gains from VDA transactions is high (at flat 30 percent) without the provision of loss-offsetting and there is a levy on one percent TDS unlike in most other countries; and on the other. there is a clear indication of VDA investors offshoring their liquidity. These imply that India is not only losing out on international competitiveness in the VDA ecosystem, which is closely linked to several emerging technologies, but also on scarce liquidity which is important for concurrent economic value creation in the country. Importantly, the implications of the current VDA architecture on the government's tax revenue are also unclear. Against this backdrop and the initial industry response, we recommend:

1. The government should consider lowering the TDS rate to curb its distortionary effect, particularly since any rate of TDS can meet the transaction tracking purpose. For instance, TDS levels can be analogous to those of the securities transaction tax (STT). The STT is levied at 0.01 percent, 0.1 percent or 0.05 percent depending on the nature of the instrument. The STT has set a successful precedent as it has been generating about INR 22,000 crore in tax revenues every year.

2. It is important for the government to gather hard evidence on the optimal tax rate for the VDA market, to balance buoyant tax revenues and improve the overall contribution of the VDA ecosystem in the economy. The Laffer- curve depicts the relationship between rates of taxation and the resulting levels of the government's tax revenue which typically follows an inverted U-shaped or bell-shaped curve[xii]. It is important to conduct pilots to ascertain this optimal tax structure on the Laffer Curve for the market.

3. The government should resort to a progressive tax structure with differentiated rates for short term and long-term gains akin to international best practices documented in this report. This will likely lead to increased tax collection from frequent and higher speculative gains without crowding-out the liquidity from the market.

xii. With a rise in tax rates, tax revenue rises only to a point, after which it falls which might happen due to offshoring of exchanges and investors shifting to decentralized/P2P foreign exchanges.

4. In addition to tax measures, the high volumes of P2P trade suggest that India will also need to enhance international coordination as well as institutional oversight on VDA exchanges such as an appropriate licencing scheme. The G20 platform offers an opportunity to learn from international best-practices towards both.

ANNEXURE: METHODS, ASSUMPTIONS AND ALGORITHMS

Change-in-change (CIC) Method

The CIC model is a generalization of the oft quoted difference-in-difference (DID) model. It relaxes several assumptions of the DID model, including the parallel trends assumption between the treatment and the control groups. See Imbens and Wooldridge (2009) for a detailed discussion.

Two principal assumptions for the change-in-change model are: (A) VDA market will follow its past trajectory in the absence of a new policy shock; (B) Purely market specific disturbances (and not those pertaining to national policies) will play out alike in domestic and foreign exchanges. With these assumptions, the basic algorithm of the CIC model is as follows:

- Calculate the before-after difference in the outcome (VDA volume) for the treatment group (i.e., Indian centralised VDA exchanges, ICVE).
- Calculate the before-after difference in the outcome (VDA volume) for the comparison group (i.e., foreign centralised VDA exchanges, FCVE)
- Calculate the difference between the difference in outcomes for the treatment group and the comparison group. Then, the CIC can be represented as:

$$CIC = \left(Volume^{\text{ICVE}}_{post-event} - Volume^{\text{ICVE}}_{pre-event}\right) - \left(Volume^{\text{FCVE}}_{post-event} - Volume^{\text{FCVE}}_{pre-event}\right)$$

Liquidity Flight from Indian Centralised VDA exchanges to Foreign Centralised VDA Exchanges

Liquidity flight on account of the substitution effect

- Derive the weightage Indian users give to Foreign Centralised VDA Exchanges (FCVE), prior to Feb-22 (during Nov-21 and Jan-22).
- Construct the potential Indian user traction on FCVE by multiplying the total Indian user traction with the weight constructed in the previous step.
- Construct excess user traction on FCVE by subtracting the potential trac-

tion from the actual traction on FCVE.

- Liquidity flight on account of the substitution effect is product of this excess user traction to FCVE with average exchange volume per Indian user.

Liquidity flight on account of the growth effect

- User traction portray persistence in level and growth. Therefore, the counterfactual path of the total Indian user traction, post Feb-22, can be constructed as:

$$Traction_t = Traction_{t-1} + \frac{(Traction_{t-1} - Traction_{t-2}) + (Traction_{t-2} - Traction_{t-3})}{2}$$

- Derive unaccounted user traction growth as the difference between the counterfactual obtained in the previous step and the actual path of user traction.
- Construct excess user traction on FCVE by multiplying the unaccounted user traction growth, derived in the previous step, with 0.495. The latter statistic is the share of user traction on FCVE prior to Feb 2022.
- Volume shift on account of the growth effect is the product of this excess user traction on FCVE and average exchange volume per Indian user.

Future Projections for Volumes of Indian Centralised VDA exchanges

- Assuming that volumes of Indian centralised VDA exchanges (ICVE) follow a similar trajectory as after the tax announcement/regulations, as before them. Therefore, Feb 2022 onwards, the counterfactual volume of ICVE (i.e. potential volume) can be computed as:

$$Potential\ volume_t^{Indian} = \begin{cases} Actual\ volume_t^{\text{ICVE}} & for\ t < Feb\ 2022 \\ Potential\ volume_{t-1}^{\text{ICVE}}\ x\ \dfrac{Actual\ volume_t^{FCVE}}{Actual\ volume_{t-1}^{FCVE}} & for\ t \geq Feb\ 2022 \end{cases}$$

- Assuming that the future trend of ICVE volume to portray persistence in level and growth, as has been the case before Feb 2022. Therefore, starting Nov 2022, we project the trend volumes of ICVE using the potential volume data in the previous step, using the following method:

$$Potential\ volume_t = Potential\ volume_{t-1} + (Potential\ volume_{t-1} - Potential\ volume_{t-2})$$

where t represents Nov 2022 or months thereafter.[xiii]

xiii. There exist several methods for future trend projections, but most of them have stringent temporal data requirements. The used method offers a balance between parsimony and limited availability of data.

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B-40 First Floor
Soami Nagar South
New Delhi - 110017
contact@esyacentre.org
www.esyacentre.org