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Can Governments Increase Revenues By Lowering Taxes? A Study of Competing Policies To Reduce Tax Evasion During House Purchase in India

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Abstract

The dominant public policy prescription to reduce under-reporting in land and encourage registration of land transactions is rooted in the research undertaken by the WorldBank by Alm et al(2004) who estimate that reduced stamp duty regimes would likely reduce under-reporting, leading to better pricing and unlocking of wealth in real estate. Very little research, however, has validated the fundamental premise that reduction in stamp duties naturally reduces under-reporting, especially in the absence of other independent monitoring or enforcement mechanisms. In this study, we investigate, firstly, whether reduction in stamp duty leads to reduction in under-reporting. We use a quasi-natural experiment where stamp duty for registration of immovable property transactions was reduced in successive waves in the thriving metropolis of Bengaluru, Karnataka, India. By evaluating the truth-telling before and after the successive reductions in stamp-duty rates, we ascertain the extent to which stamp-duty reduction incentivises truth telling. We find that change in stamp duty values does not incentivise truth-telling and governments are better-off in providing robust minimum alternate values for assessment (or "guidance values"). This research has huge policy implications for tax collection and reduction of black money.

Keywords: Under-reporting, black money, stamp duty, minimum alternate tax, land value assessment

Local and regional governments are usually cash-strapped and raise resource through various indirect and direct taxes (Brennan and Buchanan, 1980)[1]. Efficient tax collection systems need to be in place for local governments and municipalities to generate adequate resources to meet welfare objectives such as poverty alleviation and expenditure on health and education. One of the commonly used methods of direct taxation is the ad-valorem stamp duty on property transactions, levied at the time of registration of properties. This forms a large chunk of the revenues of local governments, especially in developing countries. However, property markets are thin and opaque and abstracting property values is a difficult and cumbersome process; under-reporting of property prices is rampant leading to substantial losses to the exchequer. This is a common problem faced in most emerging markets where lack of credible property prices impacts ad-valorem tax revenues based on the self-reported property prices.

The dominant public policy prescription to reduce under-reporting and encourage registration of transactions is rooted in the research undertaken by the WorldBank in the early 1990's. Alm etal.(2004), in a World-bank study on stamp duty, estimate that reduced stamp duty regimes would likely reduce under-reporting, leading to better pricing and unlocking of wealth in real estate. Morris and Pandey (2009)[2] also emphasise the need to reduce transaction costs such as "stamp duties" (which includes stamp duty liability as well as registration fee) to reduce under-reporting. Various governments have subsequently implemented the reduction in stamp duty to increase registrations and to motivate reporting at the right transaction prices. Very little research, however, has validated the fundamental premise that reduction in stamp duties naturally reduces under-reporting, especially in the absence of other independent monitoring or enforcement mechanisms.

There is no substantive proof that reducing stamp duty reduces under-reporting, or that it increases the revenue to the government through better transparency in property prices. If reduced stamp-duties did not lead to reduced under-reporting and better price discovery, the larger effects on unlocking real estate wealth and kick-starting land-based municipal finance would not take off as expected. Again, it was expected that reduced under-reporting would make up for the losses to the exchequer caused by reduction in the stamp duty, making the change revenue-neutral. Simply reducing stamp duties may not be adequate to incentivize people to report true transaction values. While high stamp duty rates certainly act as a deterrent to revealing property transaction prices, -re-investment of black money in real estate and other related taxation aspects may incentivize under-reporting even in the reduced stamp-duty regimes, hurting the fisc.

In the current paper, we investigate, firstly, whether reduction in stamp duty leads to reduction in under-reporting. We use a natural experiment where stamp duty for registration of immovable property transactions was reduced in successive waves in the thriving metropolis of Bengaluru, Karnataka, India. By evaluating the truth-telling before and after the successive reductions in stamp-duty rates, we can ascertain the extent to which stamp-duty reduction incentivises truth telling. We also compare the outcomes from stamp duty reduction to other mechanisms that governments can utilise to incentivise truth-telling in property prices which has a revenue-neutral stand.

[1] Brennan, G., & Buchanan, J. M. (1980). *The power to tax: Analytic foundations of a fiscal constitution*. Cambridge University Press.

[2] Patel, B., Ballaney, S., Koshy, C. K., & Nohn, M. (2007). Reforming urban land management in Gujarat. *India Infrastructure Report 2009*, 176.

While stamp duty is certainly a mechanism to incentivise truth-telling, successive governments have found that this is not a natural outcome, especially where there is no mechanism put in place to independently assess property prices. To counter this tendency of buyers to under-report, State agencies have developed a system of assessed values for properties at a locality-level, called the guidance values or circle values[3], which are the 'assessed market values for the purposes of registration'. These guidance values are pegged to the market values, with a standard discount applied to the mean market value of the locality. The assessed market values are published and updated by the government at periodic intervals and these form the basis on which registration charges and stamp duties are calculated. Therefore, the buyer may under-report transaction value to save on stamp duty and registration charges, but it cannot be less than the floor value prescribed by the State in its equivalent 'assessed market value for the purposes of registration', viz. the guidance values.

These 'guidance values' are similar to the principle of presumptive taxation used in income tax literature, and are used to calculate the minimum tax liability on properties. Presumptive taxation is typically used for 'hard-to-tax' population (Thuronyi, 2005), and charges a tax on presumed income or on actual income, whichever is higher. Similarly, the guidance value forms a floor amount or a minimum assessment value based on which ad valorem stamp duty may be calculated. Stamp duty is calculated on either the guidance value or actual transaction value, whichever is higher.

The current paper, then, studies the incentive/disincentive mechanism of the state in under-reporting of transaction values. The state, in every period, chooses to use one of the two mechanisms at its disposal - the guidance value and the stamp duty - to elicit true market transaction values. If the high stamp duty tax burden is the reason for under-reporting, then reducing the stamp duty should lead to increased tax compliance, ceterus paribus. Instead, if the under-reporting were to be caused by individuals and public officials exploiting systemic inefficiencies, reduction in stamp duty rates may not necessarily lead to higher compliance.

In the specific context of India, we study which of the two tools - the stamp duty or the guidance value - leads to higher truthful reporting of property prices. Using a hedonic model developed from appraisal reports on residential properties, we build an under-reporting metric which captures the degree of under-reporting at various regimes of stamp duty decreases and guidance rate increases using an event study approach. We further analyse the unintended consequences of guidance value as an assessment value for presumptive taxation and whether it is inflationary.

The study adds to policy dialogue in India as well as in other emerging economies where the received wisdom is in terms of decreasing stamp duty. Our results will provide insights to the governments, especially in developing countries, on innovative policy tools for raising revenues despite constraints such as corruption and weak enforcement. By teasing out the impact of stamp duty reduction and guidance value assessments on registration values, we also wish to strengthen or challenge the existing assumption that stamp duties per se are drivers of tax evasion.

The rest of the paper is organised as follows: Section two provides a brief overview of the extant literature in this field; Section III touches upon the basic legal and administrative structure of stamp

[3] known variously as Jantri rates, circle rates, guidance rates, guideline values, guidance values, etc. in various states across India.

duties and guidance values, and some comparisons with international practise. Economic effects of stamp duties and guidance values are then discussed and the research gap in Section IV delineates the exact hypothesis that form the core of this paper. The data and methodology are discussed in detail in Section V and the final section summarises our results and conclusion from this study and the policy implications hat can be drawn from it.

Literature Review of Stamp Duties and Guidance Values

In this section, we provide a context to the discussions around the quasi-natural experiment whereby we ascertain whether the objectives of this study, viz. a) reduction in stamp duties reduces under-reporting and b) comparing the efficacy of guidance value as a policy tool vis-à-vis reduction in stamp duties in incentivising truth-telling.

A. Legal and Administrative basis for Stamp Duties, Registration Values and Guidance Values

(i) Stamp Duty

In India, Stamp Duty (SD), under the Stamp Act of 1899 was established as a tax that is levied on legal documents and a stamp duty paid document is considered a valid legal instrument having evidentiary value of being used in courts. The Indian Stamp Act, 1899, is a Central Government Act but administered mostly at the State level. Each State therefore has the authority to enact its own version of the stamp duties act applicable within its jurisdiction. This leads to a scenario where each State has broadly similar laws on the specific features of the Stamp Act, but with allowances for State specific characteristics.

Transactions on property and related mortgage deeds mandate the use of stamp duties. Duties are determined "ad-valorem" i.e., mandated to be paid as a percentage of the value of the property. Different States have different rates of Stamp Duties that are levied, and these could differ by property transaction value, type of property, type of transaction (outright sale, mortgage, lease etc) and various other factors. The stamp duty, naturally, varies across different states in India. As Alm et al. (2004) note, SD was characteristically high pre-2003-04 with rates to the effect of 12-14 percent. Such a high burden of stamp duty would naturally entail evasion through underreporting and thus perpetuating the growth of a shadow economy. Over the recent years this has been streamlined to a stable 5 percent under the suggestions from Jawaharlal Nehru National Urban Renewal Mission (JnNURM), a flagship urban renewal program of the Ministry of Housing and Urban Affairs, India.

(ii) Registration Charges

Apart from Stamp Duty, which is an ad-valorem levy on the transaction itself, there are other one-time document registration charges at the time of transfer of immovable property. Document Registration (DR) is a mechanism to establish a legal standing to a transaction by registering the documents testimonial to the transaction. This is based on the Registrations Act, 1908 which lays down the code for written instruments evidencing a transaction to be registered under the Registrations Act, 1908, with the exemption of certain trivial contracts outlined in the act. Typical rates of document registration are in the range of 1-2%, as outlined by the respective State Government.

Like the Stamp Act of 1899, the Registrations Act of 1908 is also a Central Government Act that States have modified retaining common elements but customised to the usage within the State.

Both Stamp Duty and Registration charges are a Tax on Transfer of Immovable Property (TTIP) levied on the sale price of the immovable property[4]. For the purpose of this study, we consider both the Stamp Duty and the registration charge as Stamp Duties (SD) levied on the property.

(iii) Guidance Values

While the Alm et. al. (2004) studies indicate that stamp duty reduction may increase revenues from registrations, it is difficult to perceive the actual impact of reduction in stamp duty given the various other incentives to under-report in India. The Wanchoo Committee (1971) which had studied under-reporting in transaction prices had introduced the concept of Circle Rates or Guidance Values which is the assessed market value of the property as per the State. Guidance values act like a presumptive taxation on registration, and provide the floor price at which a transaction in a certain locality may be registered. Stamp Duty liability is levied on the actual transaction value or the guidance value applicable, whichever is higher.

A number of states enacted amendments to the respective State Stamp Acts to empower the district registrar or other competent authority to evaluate and assess the Circle Rates (CR) or Ready Reckoner Rates or Guidance Values in various states which form the 'assessed market value for the purpose of registration of property'. These rates are updated from time to time by committees as appointed by the state machinery. These committees usually comprise of officials of the office of the Inspector General of Revenues and Stamps, empanelled Valuers, brokers, etc.

B. Stamp Duties as a source of Revenue for local governments

The capacity of the State to tax property through various mechanisms has been well established in literature (Besley and Persson (2007)[5]). Local government finance is largely dependent on taxes raised from property since property prices are directly related to actions of the local government; there is substantial evidence to show that states that are able to raise tax income efficiently are usually more efficient in provision of public goods (Newbery and Stern, 1987[6]). Taxes underwrite the ability of the State to provide public goods, and inefficient taxation distorts the balance between accumulation and redistribution and leads to shortfall in provision of security, health, education and poverty alleviation measures (Brautigam et al (2008)[7]). Oates (2001)[8] has an excellent review of property taxation and municipal finance, especially for developing countries.

[4] Kopanyi (2008), "Property Taxation in Federal Countries", accessed at http://siteresources.worldbank.org/PAKISTANEXTN/Resources/Publications-and-Reports/367132-1234146800572/PropertytaxationFederalstates.pdf

[5] Besley, T., & Persson, T. (2007). *The origins of state capacity: Property rights, taxation, and politics* (No. w13028). National Bureau of Economic Research.

[6] Newbery, D., & Stern, N. (1987). *The theory of taxation for developing countries*. Oxford University Press.

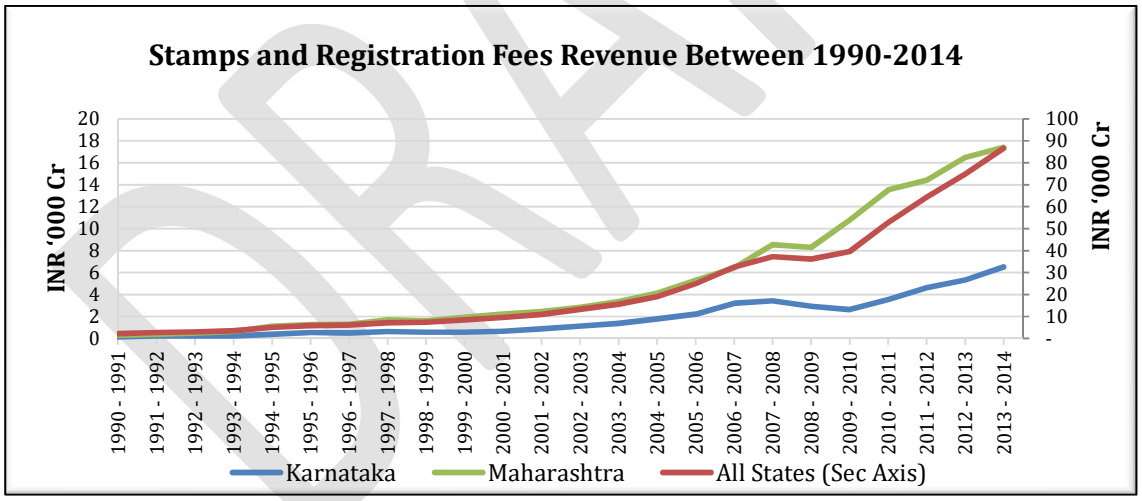
[7] Brautigam, D., Fjeldstad, O. H., & Moore, M. (Eds.). (2008). *Taxation and state-building in developing countries: Capacity and consent*. Cambridge University Press.

[8] Oates, W. E. (Ed.). (2001). *Property taxation and local government finance*. Lincoln Inst of Land Policy.

Taxation based on property takes various forms, and one of the most popular forms is the levy of Stamp duty or registration tax which is charged at the time of registering transactions in the property. Other forms include betterment charges levied at the time of conversion from rural to urban land, as well as property tax, which is a form of annual levy on property and land (or site) value taxation, which is a type of levy on land value appreciations. These and other variations of property taxation are discussed in Bird and Slack (2004)[9]. The authors, who study property taxation across 25 countries, indicate that property taxation accounts for a large proportion of tax revenue at the sub-national level, usually upto 40% of sub-national tax revenue in developing countries, 35% in developed countries and only about 12% in transitional economies. The role of property taxation in its various forms is thus an important component of revenue for the sub-national government, and any inefficiency in its collection has deleterious impact.

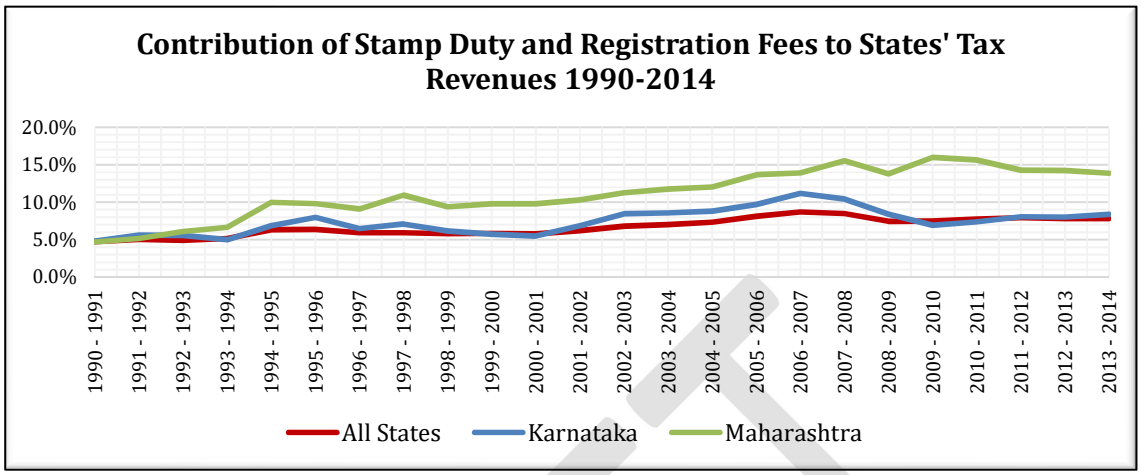
In India, Stamp duty and registration fees have traditionally contributed significantly to the state tax revenue. Figure 1 shows the contribution of SD and RC to state revenues. Over the last 15 years the contribution has been consistently over 5 percent. Currently, about 8 percent of all state revenues in India come from stamp duty. States like Maharashtra earn as high as 13% through Stamp Duty levies. Stamp Duty levies contributes around 6% of India's GDP compared to less than 2% world over (Table 2).

Figure 1: Stamp and Registration Fee Revenue Between 1990-2014 for various states



[9] Bird, R. M., & Slack, N. E. (Eds.). (2004). *International handbook of land and property taxation*. Edward Elgar Publishing.

Figure 2: Contribution of Stamp Duty and Registration Fee to States' Tax Revenues 1990-2014



A. Under-reporting of Property Prices – Evidence in developing markets.

Unlike income tax and other taxes that are based on flows, property related taxes are based on stock values (asset values). Again, unlike taxes that are withheld, property taxation is a very visible taxation that has to be paid in lump-sum payments based typically on the value of the property (ad valorem). Valuation for ad valorem taxation is always fraught with complications: where "self assessment" is allowed, owners typically undervalue their property, and where "official assessment systems" of valuations are utilised, owners feel their property is relatively overvalued. (Bird and Slack, 2004).

Many authors have discussed the under-reporting of property prices in ad valorem taxation from multiple perspectives. Under-reporting in self assessment of property taxes is almost thought of as a 'necessary evil' since the process of obtaining "good" valuations for properties are not cheap. As Bird and Slack, (2004) state " …. to administer a property tax at the same level of fairness (non-arbitrariness) as most other major taxes is both a costly operation and one the results of which are unlikely to be accepted as fair by most taxpayers". This has led various governments to move to 'self-assessment' where the government reserves the right to buy the property at the stated 'self-assessed' price of the individual (Niou and tan, 1994)[10].

Previous compliance studies on direct assessment bring forward the importance of audit and punishment (Allingham and Sandmo (1972) and Lewis (1982)). Apart from audit, other demographic factors such as age, gender, marital status, income sources (Spicer and Lundstedt (1976), Vogel (1974), Mason and Lowry (1981), Wahlund (1992)) play an important part. More individuals are likely to pay

[10] Niou, E. M., & Tan, G. (1994). An analysis of Dr. Sun Yat-sen's self-assessment scheme for land taxation. *Public Choice*, *78*(1), 103-114.

truthfully[11] if taxes are fair and equitable (Harris, 1989). Specificially for property related taxation, convenience and trust increase compliance. (Warkentin, etal 2002)[12]

While relative undervaluation and overvaluation between self assessment and official assessment has been studied quite well with reference to property taxes, there is not much by the way of literature in the conveyance-duty (stamp-duty on conveyances) space. Indeed, since most developed countries have systems of tracking price and transaction data closely, there is not much scope for under-reporting of property prices during the conveyance process. It is a unique situation pertaining to developing countries where lack of credible property price data leads to under-reported transaction prices and therefore, reduced stamp duty liability.

Studies on under-reporting of transaction value are documented across some parts of South East Asia, India and Africa. In Kenya, Nairobi, government officials assess the value of each property physically and obtain the closest market values: this process, however, is prone to corruption and collusion. In China, the government and private sector appraisers value the parcel to be leased out; though some corruption exists anecdotally, competitive auctions provide an alternative base for the market value.

Underreporting of property prices is important to the government from another perspective: it leads to black money generation at the individual level and societal level. The deleterious impact of black money on public finances and quality of administration (Dessy and Pallage, 2003[13]; Slemrod 2007[14]), as well as in restricting access to credit through formal financial channels is well documented. Real estate investments are also more prone to channelizing unaccounted funds due to the political-economy nature of the business. Money laundering is also harmful to the welfare of the entire economy since illegal money has lower multiplier effects[15]. The GOI (2012)[16] report notes that 'the tax incidence applicable on real estate transactions in the form of stamp duty and capital gains tax can create incentives for tax evasion through under-reporting of transaction price. This can lead to both generation and investment of black money.'

In India, under-reporting of property prices has been evidenced quite extensively.

- "Stamp Duty and Registration Fee in West Bengal, Draft Report by Gopalakrishnan and Das-Gupta (1986) has documented under reporting between the years 1978 and 1983 and this is shown in table 2.2.

[11] A tax system has to follow certain principles, namely equity, certainty, convenience and efficiency (Lymer and Oates (2009); Barjoyai (1987). An equitable system is one which is fair across taxpayers and taxpayers pay as per their individual capacity; certainty refers to the individuals ability to predict their tax liability and the timing when it is due; convenience refers to the ability to engage comfortably with the system through e-governance mechanisms, paying over the internet, paying in installments, and being able to file claims and taxes easily. Efficiency of taxes refers to administrative efficiency or process efficiency, where costs of collection are kept low, and economic efficiency, where taxes do not change the economic behaviour of the individual.

[12] Warkentin, M., Gefen, D., Pavlou, P. A., & Rose, G. M. (2002). Encouraging citizen adoption of e-government by building trust. *Electronic markets*, *12*(3), 157-162.

[13] Dessy, S., & Pallage, S. (2003). Taxes, inequality and the size of the informal sector. *Journal of Development Economics*, *70*(1), 225-233.

[14] Slemrod, J. (2007). Cheating ourselves: The economics of tax evasion. *The journal of economic perspectives*, 25-48.

[15] Yikona, Stuart, Brigitte Slot, Michael Geller, Bjarne Hansen, and Fatima El Kadiri. Ill-gotten money and the economy: Experiences from Malawi and Namibia. The World Bank, 2011.

[16] Government of India (2012) "White paper on Black Money" published by Ministry of Finance; accessed at http://www.finmin.nic.in/reports/whitepaper_backmoney2012.pdf on 20th November 2015.

- Another recent study at the NIPFP estimated that under reporting of transactions in land and buildings were between Rs. 980 crore and Rs. 2205 crore for the whole of India for 1970-71.

Table 1: Under Reporting as a Percentage of Declared Value

Year	Delhi	Bombay	Madras
1978-79	50	35	-
1979-80	60	55	11
1980-81	66	48	23
1981-82	73	114	32
1982-83	91	65	48

- "Black Money in the Real Estate Sector: A Study" by Tandon (1987) makes a case that the net gain will increase in the terminal year when the house is sold, given that the true sale price of the house is underreported. If 16 per cent is the reported appreciation in land value, untaxed unreported appreciation would be 40 per cent of the total sale price. The present value of housing investment in this case is Rs. 1.23 lakh for a 30% bracket taxpayer compared to Rs. 0.56 lakh for an all-white sale. This under-reporting of the sale price by 40 % results in an evasion of tax of a little more than Rs. 5.6 lakh which is about Rs. 75 per Rs. 100 of investment.

C. Stamp Duty Rates – International Evidence

In comparison to the regimes in several countries the stamp duty rate across various Indian States is rather high. The table below gives a comparison of the SD policy of different countries and different SD policy practices found in these countries depending on social needs. Low stamp duty rates are not limited to industrial countries. Countries like Vietnam and Philippines have stamp duties between 1-2%. High stamp duty rates as evidenced in India have been counterproductive as they have incentivized corruption and fraud through tax evasion resulting from a weak administration.

As highlighted in table 1, very few countries have a stamp duty regime that is in excess of 5%. Only in case of a handful, very high value transactions are charged a rate greater than 5 or close to 8 or 9 %. This is still low in comparison to rates high rates 12-14 % that prevailed in India pre 2003-04. In the recent years however the Indian stamp duties have been reduced considerably to around 5%, which put in perspective of other countries is still high.

Stamp duties in India range from 5% to 12% across various states. The state of Karnataka, where our study is located, for instance has mandated under the Karnataka Stamp Act, 1957 that the sale deed needs to be registered; the Karnataka Stamp Act schedule Art 20 [(1)] mandates that the proper stamp duty levied on transfer of immovable property is to be Five percent of the market value of said property. There is also a registration fee collected to cover administrative costs, which is levied at one percent of the cost of the tax on transfer of immovable properties (TTIP). The total cost of taxes on transfer of property therefore comes to around 5.65 percent including all other taxes and surcharges.

Figure 3: Stamp Duty Rates in Karnataka and Maharashtra during 2007- 2017

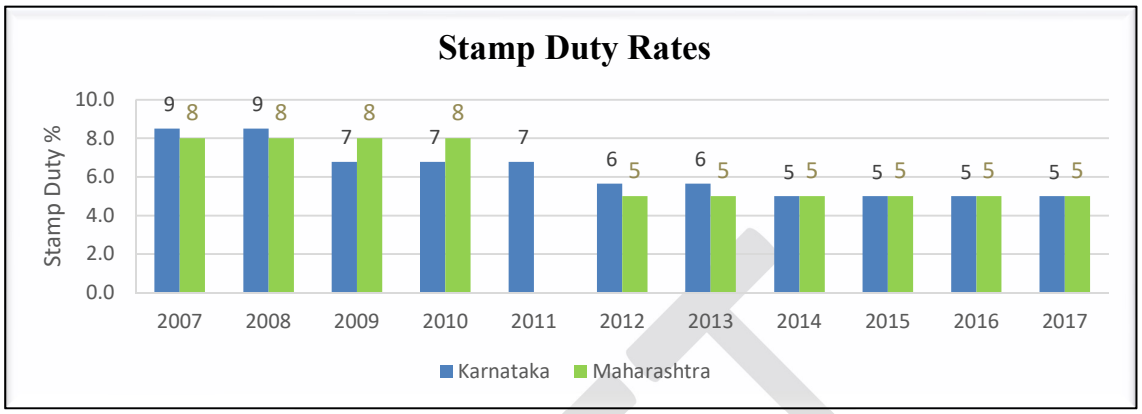


Table 2: Stamp Duty Regimes in a sample of countries

Country	Different-ial Rates	Seller side Stamp Duty	Stamp Duty Range	Comments	Stamp Duty (% of GDP)	Guarantee of Title
UK	Yes	No	0% - 12%	Median of ~3.5%	0.61%	Yes
Singapore	Yes	Yes	1% - 3% (Buyer) 0 %- 16% (Seller)	Seller stamp duty applicable depending on age of the property and holding period	0.9%	Yes
Japan	Yes	No	1% - 2%		2.15%	NA
Brazil	No	No	~2%		NA	No
France[17]	Yes	No	0.7%-5.8%	Differential stamp duties for off-plan property, new property and building land	NA	No
Germany[18]	Yes	No	3.5%-6.5%		0.37%	No
Hong Kong[19]	Yes		1.5%-8.5%	Differential rates based on the value of the property.	2.34%	Yes
South Korea[20]	Yes		0.15%-0.5%		2.44%	No
China[21]	Yes	Yes	0.01%-0.2%	Both parties entering the contract pays stamp duty.		No
Mexico	NA	NA	NA	No stamp taxes in Mexico	NA	Yes

[17] https://www.french-property.com/guides/france/purchase-real-estate/legal/fees/taxes/
[18] http://www.globalpropertyguide.com/Europe/germany/Buying-Guide
[19] http://www.gov.hk/en/residents/taxes/stamp/stamp_duty_rates.htm
[20] South Korea: Overview of the Stamp Duty Regime by David Jin-Young Lee and Kyu-Dong Kim
[21] http://taxsummaries.pwc.com/ID/Mexico-Corporate-Other-taxes

Defining the measures – Stamp Duty and Guidance Value

The 'registration value' of the property used to be left to the transacting parties' discretion a couple of decades back: rampant under-reporting of property values has led to the state governments declaring a 'guidance value' or 'circle rate' for properties below which properties may not be registered. The 'guidance value' in this case, acts as a proxy for the 'minimum market value at which properties should be registered'. The estimation of guidance values follows a method similar to mass appraisals in developed economies and takes into account the average property price in a specific area, along with additions for certain common amenities.

Every sale transaction in immovable property needs to be registered at a registration value (R) with the appropriate authority with payment of an ad valorem stamp duty. Since property markets are opaque and black money is rampant, the government has mandated a minimum assessment value on immovable property for calculation of stamp duty liability. This value, called the guidance value/circle rate (Pg), acts as a proxy for the market value with a lag. All property, therefore, needs to be registered at the minimum of the guidance value. Some parties may choose to register at the actual market value (Pm) or at any value between G and M.

$Pr(x,t) = Min\{Pg(x,t), Pm(x,t)\}$ where x: location, t:time

When guidance value is higher than the market price, there is no incentive for the buyer to under-report, and the actual consideration is reported by the buyer, since stamp duty is anyways payable on the guidance value of the property. The Black money 'B' identified arises because of the perverse incentive for buyers are aligned to reducing their tax burden in the form of stamp duty and registration charges.

Thus, the unreported transaction value (Black money, B) is the money generated in this transaction as the maximum of the difference between the actual market price per unit area less the guidance value of the area. To specify this further, let guidance value of a certain area be Pg and the market price be Pm. The black money generated in this transaction due to underreporting is then given by

$B = Max(Pm-Pg , 0)$,

The tax-gap is defined as the amount of liability that is faced by the tax-payer but is not paid. The IRS in the context of income tax defines the tax-gap with reference to a specific period of time. However, generically, tax-gap is simply the unpaid tax liability due to under-reporting of taxable components of income or value. In our specific case, stamp duty is a tax liability of the individuals who transact on the immovable property, and tax-gap refers to the tax liability that is not paid to the government due to under-reporting of the transaction value of the said immovable property.

If we denote the Stamp duty rate by s% (levied on the registration value), then, stamp duty liability of B*s is saved by under-reporting

Stamp duty tax-gap $T = B*s\% = Max(P_m-P_g, 0) *s$

In keeping with the nomenclature used in tax-compliance literature where under-reported economy is usually measured in proportion to the reported economy, we define here the non-compliance or under-reporting ratio as

α= Vu/ Vo where Vu = unreported value and Vo = reported value (Feige 1989)

If the property is strictly registered only at guidance value (minimum allowable value for registration) then alpha can be recast as

α= [Pm(x,t) –Pg(x,t)]/ Pg(x,t) ; where x: location, t:time

It should also then be recognised that guidance value is simply an estimate of market value at the time of revision.

Guidance $value_t$ = E{market $value_t$} * discount factor = E{P_m}* β

where beta is the average discount factor applied to market prices at the time of setting guidance values and P_m is the market price.

The subscript 't' is used to indicate that both guidance value and market value are time varying, with market value being a continuous function of time and guidance value being a discrete function – guidance value is updated to reflect market value at periodic intervals. The discount factor is applied to the expectation of market prices to recognise the fact that the property transacting below the mean, typically lower-valued properties should not be punished with higher tax liability, following the principle of vertical equity in mass appraisal systems.

Restating the previous equation

α = Vu/Vo = = (Pm-Pg)/Pg = Market premium / Pg

where market premium is the difference between the market price and the guidance value.

Alpha can take both positive and negative values depending on the how the guidance values are set with reference to the market values. Substituting for eqn (4) in eqn above leads to

α= (1-β)/β

reinforcing that the gap between the guidance value and the market value is the primary reason for the tax-gap in property registration markets.

In short, the "under-reporting ratio" is nothing but the 'guidance value gap' ratio.

The 'beta' factor which is the discount of the guidance value to the market value is very difficult to ascertain with any degree of confidence. Since market prices are very difficult to come by, there are very few records of true transaction values that can be used to determine the gap between the market price and the guidance value for each property. However, a certain proportion of transactions that are registered use the actual market value for registration, especially because these properties either have an associated mortgage or an insurance that reveals the true value of the transaction.

Context of the Study

The study utilised a quasi-natural experiment in the city of Bengaluru, India. Bengaluru is the 5th largest city in India with a population of about 100 million, and occupies a land area of about 900 sq km. Bengaluru has above 100,000 transactions per year in land and property transactions (both outright sale and leasing) and is the 3rd most vibrant real estate market in the country in terms of volume of real estate transacted. Registration of Land transactions falls under the purview of the Inspector General of Registration, Karnataka. Bengaluru city contributes to more than 60% of the average land revenues within the State of Karnataka and both the city and State have been fore-runners in pro-actively managing land registrations. Karnataka was one of the earliest states to computerise its land records, to have a dynamic stamp duty policy based on economic indicators, and in introducing guidance values.

Legal Framework

The Indian Stamp Act, 1899 (Act No. 2 of 1899) is a fiscal statute laying down the law relating to tax levied in the form of stamps on instruments recording transactions. The main objective of this Act was to consolidate and amend the law relating to Stamps covering all of India except the State of Jammu and Kashmir. Under the Constitution of India, the power to levy stamp duty is divided between the Union and the State[1] . While many states follow the 1899 Indian Stamp Act, Gujarat, Maharashtra, Karnataka, Kerala and Rajasthan have their separate State Stamp Acts. The Karnataka Stamp Act, 1957 was passed to consolidate and amend the laws relating to Stamps in the State of Karnataka. The Karnataka Stamp Act, 1957, governs the definition of conveyances and the stamp duties that are payable on specific deeds of conveyance. The stamp duty liability for various instruments is defined in the act. As per the act, purchase and sale of real estate attracts stamp duty as a percentage of the total transaction value, and the rate of stamp duty is fixed from time to time[2] . The Karnataka Stamp Act, 1957 has been amended multiple times since it was first passed: the Amending Act 12 of 1975 was especially relevant since this follows a pilot study on the undervaluation of properties in Bengaluru[3] . The pilot study revealed that market participants under-reported the transaction value in purchase and sale of real estate since they felt the burden of stamp duty was a sizeable portion of the transaction price. Based on this study, it was felt that there needs to be a system of 'market value guidelines' whereby the rate per unit area of lands is estimated/assessed for all areas falling under a specific jurisdiction, and made available to the public as a 'guidance rate', since self-reporting was leading to underreporting of transaction value. This 'guidance rate' would then be used as the benchmark for calculating stamp duty liability, rather than the consideration reported by the parties. The current process of assessing guidance values derives its legal station from Section 45-B of the Karnataka Stamp Act (inserted into the Act by Act No. 6 of 1999 with effect from 1-4- 1999 and now substituted by Act No. 8 of 2003). Rule 3 of Karnataka Stamp (Constitution of Committee for Estimation of Property) Rules, 1992 allowed for constitution of a committee comprising not less than three and not more than five members, derived from the Department of Revenue, Public Works, Survey and Settlement, Officers of City Corporation or City Municipal Council, Town Municipal Council, Town Panchayat or Gram Panchayat and an expert in the field of valuation of properties. The committee then provided guidelines for estimating the market value of vacant lands, residential sites, buildings and properties other than lands, house sites and buildings, and published the same under Rule 7. Section 45-B of the Stamp Act was substituted by Act No. 8 of 2003, which has come into force

with effect from 1-4-2003. Under the amendment, the State Government issued a notification to constitute the Central Valuation Committee for 'estimation, publication, for revision of market value guidelines of property in any area in the State' for the purpose of Section 45-A of the Stamp Act.

The CVC is set up under the Chairmanship of Inspector General of Registration and the Commissioner for Stamps, and is the final authority for formulation of policy, methodology and administration of market value guidelines in the State.

Two sources of data are used in estimating the Actual or True market price for each locality / sub-locality by the CVC. 1. The top 5% of registration values that are higher than guidance values are used as an estimate of true market value 2. Independent Broker estimates that are collected by the various components involved in the CVC are used to estimate true market value The subset of properties that are covered under these two criteria may not be comprehensive enough to estimate for the entire city. In that case, a general increment that is pegged to the observed market wide increase is applied to the existing guidance values to come up with the new guidance values.

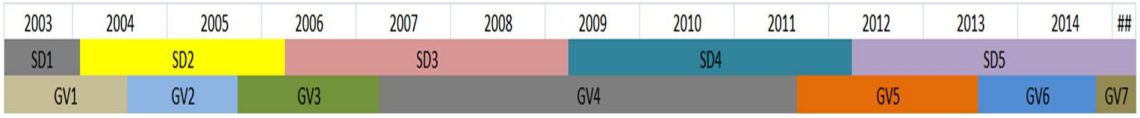
The Stamp Duty to be paid at the time of land registrations is set by the Government of Karnataka through the power vested in it by the Karnataka Stamp Act, 1957, As per the act, purchase and sale of real estate attracts stamp duty as a percentage of the total transaction value, and the rate of stamp duty is fixed from time to time.

Table 3 portrays the guidance value and stamp duty regimes over time. Figure 4 expresses the same graphically.

Table 3: Updates to Guidance Values in Karnataka

Stamp Duty Changes Effective dates and rates	**Guidance Value changes Effective Date**
From 1-Apr-2003 to 31-Jan-2004 (SD1)	From 1-Apr-2003 to 1-Aug-04 (GV1)
From 1-Feb-2004 to 31-Mar-2006 (SD2)	From 2-Aug-2004 to 13-Oct-2005 (GV2)
From 1-Apr-2006 to 31-Mar-2009 (SD3)	From 13-Oct-2005 to 18-Apr-2007 (GV3)
From 1-Apr-2009 to 31-Mar-2012 (SD4)	From 19-Apr-2007 to 25-Sep-2011 (GV4)
From 1-Apr-2012 till end of data set (SD5)	From 25-Apr-2011 to 11-Aug-2013 (GV5)
	From 12-Aug-2013 to 16-Nov-2014 (GV6)
	From 16-Nov-2014 to end of dataset (GV7)

Figure 4: Concurrent changes to Guidance values and stamp duties.



Research Gap

While the Alm et. al. (2004) studies insist that stamp duty reduction may increase revenues from registrations, it is difficult to perceive the actual impact of reduction in stamp duty given the various other incentives to under-report in India. Simultaneously, governments in India have a mechanism similar to presumptive taxation on registration, using 'guidance values' or assessed values of properties. The research gap here is to study the impact of changes in stamp duty and guidance value on under-reporting of transaction values, and to identify which of these two mechanisms increases truth-telling in the users.

The efficiency of these two instruments, stamp duty and guidance value, in eliciting true tax liability is dependent on a variety of factors. High tax liability makes it more profitable to under-reporting and to evade taxes on the margin (Allingham and Sandmo, 1972); therefore, lowering stamp duty will have the impact of reducing tax evasion and increasing the tax-net. This works well as a mechanism to decrease evasion in conjunction with strictly enforced penalties for tax avoidance.

By contrast, presumptive taxation tools are efficient in reaching the hard-to-tax target population or in cases where administrative overheads of tax collection and monitoring are too large to be done with a positive benefit to cost ratio. Presumptive tax assessments result in a minimum tax liability for the individual; for the tax administration, it replaces the costs of 'enforcement and monitoring' with the cost of 'standard setting'. Since the onus of negating the presumptive tax is on the individual rather than on the tax administration, presumptive tax works as a good mechanism in increasing the tax net where enforcement penalties are weak.

'Black money' has been at the forefront of the policy-centric debates in many emerging economies, and excessive regulation, weak enforcement and heavy tax burden are widely regarded as enabling aspects that push economic activities underground, with self-defeating results. (Dessy and Pallage, 2003). One notable estimate of the Alm et.al. (2004) indicates that the implied black economy share of GDP from real estate is about 17%. Any attempt at increasing truthful self-reporting amongst buyers would reduce this black money generated from real estate.

There are multiple solutions that have been proposed to combat under-reporting. The government has an option to purchase land at transacted prices (introduced in 1986 through IT Act) in case it finds gross under-reporting on any property. Also, the government tries to reduce under-reporting through disclosure and constraints during tax administration, including use of PAN card, deducting TDS at time of transaction. The two other methods that the government can use are to decrease stamp duty, Gopalakrishnan and Das-Gupta (1986), Alm et al (2004), linking stamp duty reduction with federal funding (JNNURM scheme); otherwise, the government can combat the menace of black money in land transactions through alternative estimates of market values.

Our study focusses on identifying which of these two measures – rationalising stamp duty, or increasing guidance value leads to better tax compliance through lesser under-reporting. However, in dealing with Indian markets where price transparency is quite low, there is no reliable estimate of market price that may be used to ascertain quickly the efficacy of both these options.

Our methodology is as follows, and our research focuses on two dominant outputs:

a) Calculating the unreported transaction values using a hedonic model based on property prices: Unlike in many developed economies, the land registration price information in India is grossly under reported and is not indicative of the price of the property. To capture the right price of the property, we use a set of properties that are registered at a premium to guidance values to estimate the true market value. Similar to the CVC's methodology, we use the properties that form the top 95% percentile of the price distribution by each area as the market value. The true market value is then regressed on amenity based pricing index to predict market values of all transacted properties. The gap between the calculated assessed value and the registration value is taken as the value of beta. (beta = Pm/Pg)
b) Comparing the variations of unreported transaction values calculated in (a) using an event study methodology around each change in guidance value and stamp duty. This model is used to estimate unreported transaction value every year. The unreported transaction value thus calculated is used in an event study methodology around each change of guidance value and stamp duty. This study will provide us the unreported transaction value before and after the stamp duty and guidance value changes, moderated for macro-economic changes.

Data and methodology

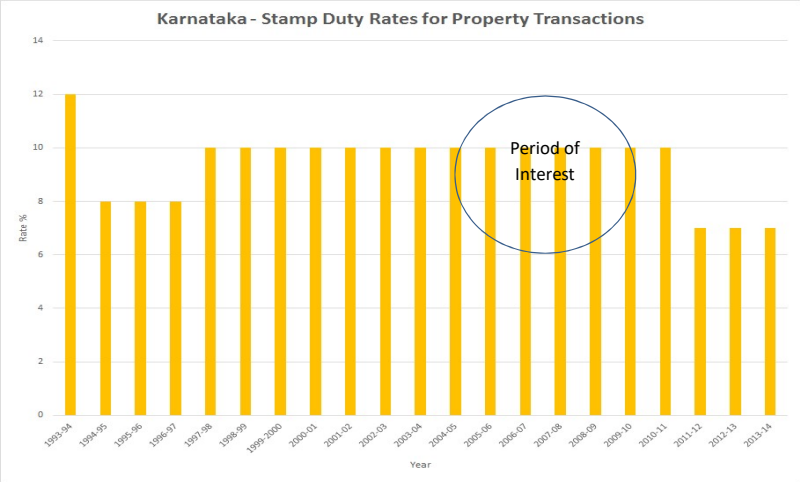
To perform the above analysis, the universe was considered as all the sets of sale transactions that were recorded in the period under consideration within the city of Bengaluru. The city of Bengaluru has an increasing volume of outright sale transactions, of which about 20% are land transactions; about 60% of these are primary market transactions and 40% are secondary market transactions.

Table 4: Historical volume of Sale Transactions per year during the event window

Annual Sale Transactions	
Year	Number
2007	195,789
2008	161,577
2009	135,604
2010	191,254
2011	258,336
2012	266,750
2013	278,645
2014	239,949

The specific period that was chosen for the study was the last event when a stamp duty change happened within a single guidance value regime, followed by a guidance value change within a single stamp duty regime. Based on this criteria, the period from Jan 2012 to November 2013 was the total period under consideration.

Figure 5: Time period of interest



Given the paucity of accurate market pricing, the first task of the research is to calculate the market value of transactions using a hedonic model based on property prices. Once the market price is estimated for each property in the study, the impact of stamp duty decrease and guidance value increased can be teased out.

A) Market Price Estimation.

As with other emerging markets, it is difficult to accurately estimate the market price of properties from the transaction price stated in the land registry at the time of registration. However, an estimate of the market price can be derived using other proxies which are beyond the land registration price data, especially by combining with other sources where there is a natural incentive for the buyer or seller to indicate a market price truthfully. One such event is where valuation of the land parcel is performed for either mortgage or insurance purposes. In the case of valuation for mortgage or for insurance, land valuation is performed by valuers/appraisers, professionals who are registered as appraisal experts under relevant laws.

There are five different types of property values that are available in India. Each of these five is discussed in some detail.

1. Guidance Value – Also known as “assessed market value for the purpose of transactions”, the guidance value (or circle rate, also known as guideline rate) is published by the Inspector General of Registrations in each administrative unit. It is based on broker estimates and public records of registration values, and is available widely, published as a government gazette notification. Ideally, barring very few cases, no transaction can be registered in the land registry for less than the guidance value. Guideline value follows market value with a lag, and has a haircut of anywhere from 30% to 90%
2. Registration value- this is the actual value that is entered in the land registry for a transacted parcel of real estate. The registration value has is used for calculating capital gains, so there is a large under-reporting from the actual market value of the transaction. The registration value has a floor as the guidance value in most cases. This value is not publicly available easily.

Figure 6: Percentage of Registration transactions valued at or below Guidance value

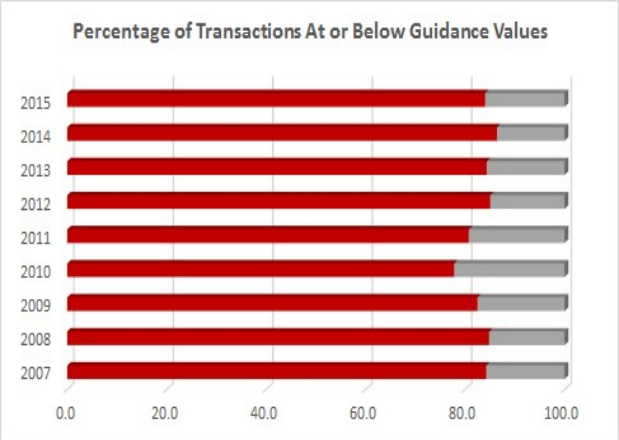
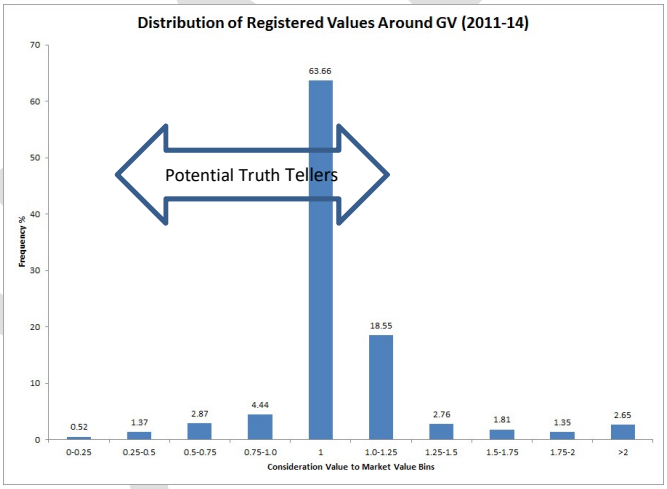


Figure 6 shows that more than 80% of properties are registered at or near the guidance value. Where registered value is higher than guidance value, there has been atleast a partial truthful reporting of the market value.

Figure 7 : Distribution of Registered Values around Guidance Value (2011-2014)



3. Valuer's data: This data is one of the richest data available on real estate transactions in India. Appraisal is usually triggered by a financial event, either for purposes of mortgage or insurance, and the appraisal is conducted by professional valuers. We obtain data from the Institute of Valuers in Bengaluru, which has valuers empanelled with several large banks amongst its members. About 10-15% of all property transactions seek bank financing, across both residential and commercial real estate. Appraisers mainly use sales comparison methods for residential valuations, and income method for commercial properties. Valuers need to be affiliated with one or more of the six recognized institutes and undergo regular course training to maintain certifications. We use valuer data to determine the best market value proxy that can be derived from registrations data. This data set is hand collected from the members of the Institute of valuers based on the valuations that are submitted by them to various financial institutions and banks.

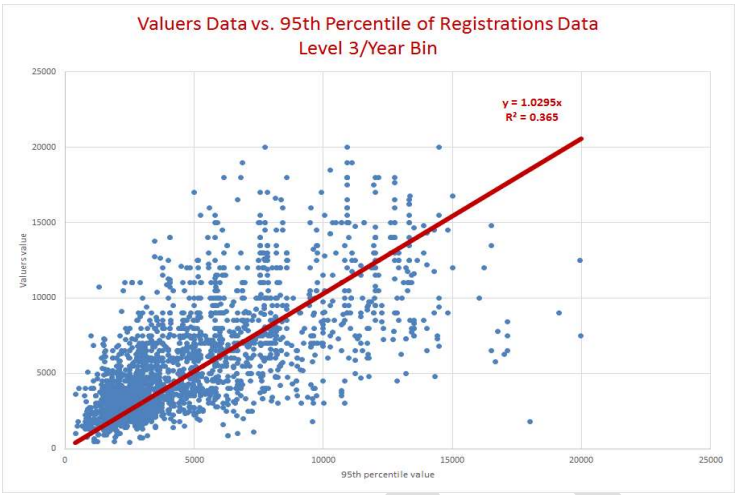
4. The Actual market value is a value that is hidden and known only to the parties to the transaction. While there is hearsay evidence on market values, this cannot be collected in a cost effective manner to perform any meaningful analysis.

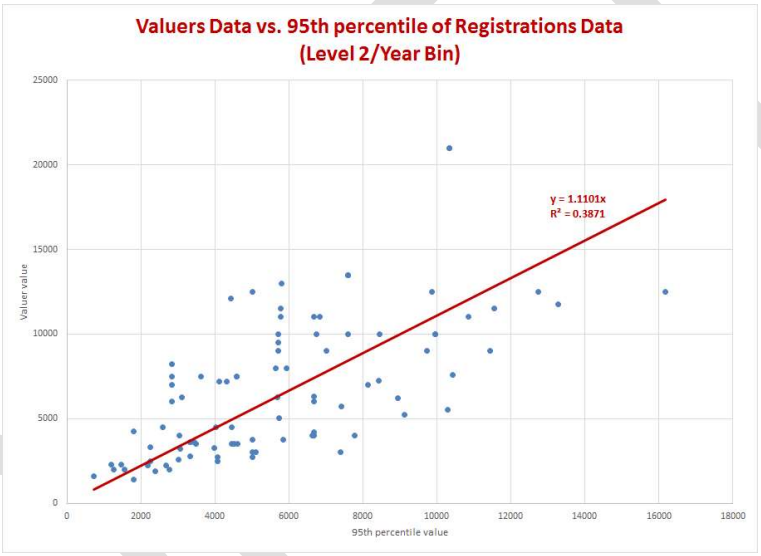
Based on the above notions of 'valuation' available for any parcel, the registration value is the largest available record of all transactions with user-reported transaction values, and the valuer's values are the closest reliable estimate of market value based on ground truthing and market movements. We utilise these two data sets to come up with an estimate of market value that we are able to use for further analysis

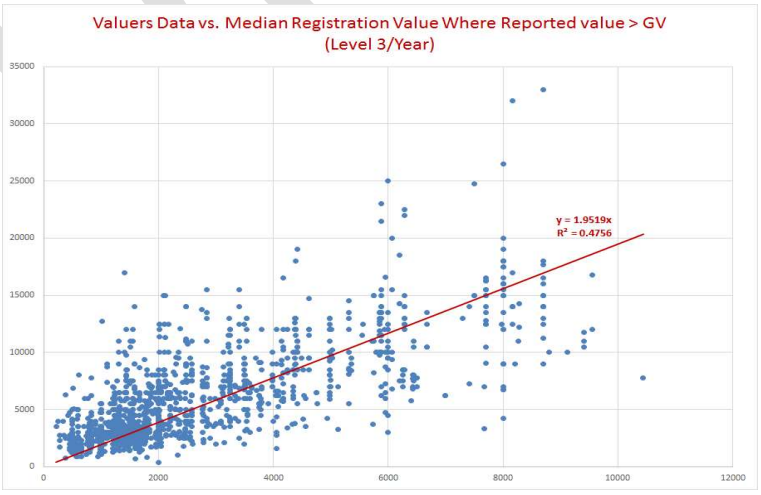
The intent is to match, for each location X Time bucket, the registration value and the market value. Once these values are determined, the distribution of the market value is super-imposed on the registration value to identify the zone of intersection where market value equals registration value. The methodology that we use is as follows.

- The first step is to determine the reported value (rate/sq.ft) for a homogenous location-time bin using registration data
- The distribution of the registration value for each location-time bin is plotted. The percentile values of this distribution are extracted (median, 90^{th}, 95^{th} and 99^{th}) using all data
- A similar analysis is done for the market value by location-time bins and the market values are plotted in a distribution.
- The truth –telling area is the zone where the market value and the registration value overlap. We use median value of this overlap (using only potential truth teller data) as the best estimate of the market value
- These values are compared with the valuer data to determine the best proxy to use for analysis to remove endogeneity (because registration value is impacted by market value with a lag)
- We use the proxy for all further analysis as market value of the homogenous location-time bin.
- For the location-time bin, addresses are split up into 3 parts using text manipulation algorithms. With Level 1 being the most granular level (e.g. street address), Level 2 at a coarse level (e.g. village or block level) and Level 3 at the least granular level (e.g. postcode level)
- Multiple time bins were used in the analysis – year, quarter, half year to check for robustness across time levels.
- The final analysis was in level 2 location (village or block level) with half yearly time periods.

Figure 6: Valuer's data vs 95th Percentile of Registration Data for various levels.







B) Event Study to determine whether Stamp Duty or Guidance Value changes lead to better outcomes.

The second section deals with conducting an event study to separate out the impact of stamp duty decrease and guidance value increase on under-reporting to identify the relative efficiency of both these tactics. The data set was split into two event study windows, one for Stamp duty and one for Guidance value. Following the principle of ceterus paribus, the stamp duty was constant during the guidance value event study window and the guidance value was kept constant during the stamp duty event study window. Each event window was considered as a two month period since this allows for adequate adjustment to take place post the change.

For the Stamp duty event study window, the stamp duty change on 1st April 2012 was considered as the event date. The two months prior, 1st January 2012 to 1st March 2012 represented the pre-stamp duty change era, 01st May 2012 to 01st July 2012 represented the post stamp duty change era, with the dates from 02nd March 2012 to 01st May 2012 (2 month period) representing the period around the stamp duty change itself.

Similarly, for the guidance value regime change which occurred on 12th August 2013, the period of 12th May 2013 to 11th July 2013 represented the pre-guidance value change era, 12th July 2013 to 11th September 2013 represented two month guidance value event window and post guidance value era was captured by the period between 12th September 2013 to 11th November 2013.

With these two time windows clearly defined, the sale transactions on vacant land that pertained to these windows of time were extracted from the registrations value data set. The study limits itself to vacant land since sites and apartments have multiple other amenities that need to be taken into account, which were not a part of the data set.

The summary statistics of the number of data points observed, the value of the registrations in INR (millions), the average registration values, guidance values and market values have been denoted in the Table 5. The summary statistics are interesting because of two numbers that stand out. While the decrease of stamp duty increases the number of registrations, it actually decreased the value of registrations. The average registration value, in contrast, shows a marginal but significant positive change, average market values show a small but insignificant positive change. This implies that stamp duty decrease leads to higher coverage of properties, especially in areas which have a higher guidance value gap (gap between guidance value and market values are higher).

The under-reporting measure is conclusive because it shows that the Stamp duty decrease leads to an increase in truth telling from 1.2977 to 1.2278, a fall of 6.98%, compared to a guidance value change, which increased truth telling by nearly twice as much at 13%.

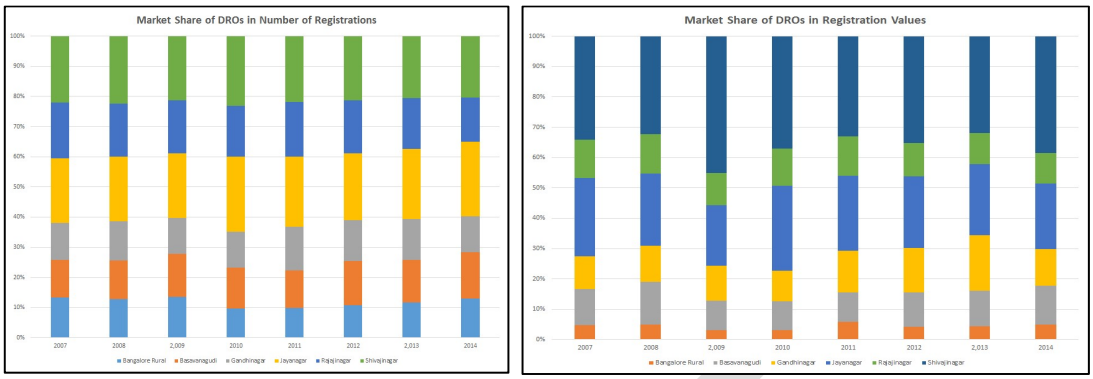
Table 5: Summary Statistics

	Event 1 (Stamp Duty Decrease)				Event 2 (GV Increase)			
	Pre (Jan-Mar 2012)	Post (May-Jul 2012)	Diff	T-stat	Pre (May-Jul 2013)	Post (Sep-Nov 2013)	Diff	T-stat
Number of registrations	8,566	8,600	444		10,003	8,059	-1,944	
Value of registrations (Million INR)	16,969	16,663	-306		20,090	18,442	-1,648	
Average registration value	1,274	1,307	33**	2.19	1,349	1,508	158***	8.54
Median registration value (per sq.ft)	1,000	1,000	0		1,000	1,000	0	
Average guidance value (per sq.ft)	1,184.5	1,198.5	14	1.12	1,205	1,444	239***	14.16
Median guidance value (per sq.ft)	999.9	990	-9.9		910	990	80	
Average market value (per sq.ft)	2,535	2,553	18	0.75	2,810	2,933	123***	4.18
Median market value (per sq.ft)	2,504	2,248	-256		2,325	2,310	-15	
Under-reporting measure	1.2977	1.2278	-0.0698***	-3.63	1.445	1.315	-0.13***	-6.46

'***' significance at 99% and '** denotes significance at 95%.

A location specific fixed-effects model test is also performed to confirm the relative impact of the stamp duty change vis-à-vis the guidance value change. Location specific fixed effects account for the heterogeneity in market value discovery by location. If the mix of property locations is different across both the guidance value and the stamp duty sub-samples, the location specific fixed effect factor will absorb the heterogeneity. Similarly, the sub-registrar office is the local entity where the guidance value changes are enforced. If there is variable enforcement (higher or lower levels of corruption) in different SRO offices, the SRO dummy captures the same. We use the District Registrar office and the Sub-registrar offices as factor effects in the model equation. There are 8 District Registrar Offices and about 42 sub-registrar offices which roll into the 8 District Registrar Offices. The Sub-registrar office is responsible for registering land transactions and for identifying the closest market value for properties in their jurisdiction and providing the same to the CVC.

Figure 6: District Registrar Offices : sale transactions in Volume and in Value



The results of Table 6 indicate clearly that there is a higher drop in under-reporting due to a change in guidance value (a drop of -0.7 per change in guidance value) which is much higher compared to a decrease in stamp duty. In fact, though the stamp duty measure is insignificant, the positive value indicates there is a *decrease* in truth telling because of stamp duty decrease. We analyse this further.

Table 6: Fixed Effect Regressions

Dependent Variable →	Under-reporting Measure	
	Event 1 (Stamp Duty Decrease)	Event 2 (GV Increase)
Intercept	0.65**	-1.09***
	(2.02)	(-3.10)
Stamp Duty Change Dummy	0.02	
	(0.63)	
Guidance Value Change Dummy		-0.70***
		(-15.78)
Time Trend	-0.01	0.11***
(Months from sample beginning)	(-1.44)	(11.28)
Area (in sq.ft x10^7)	-2.66	58.6***
	(-0.24)	(3.57)
Vacant Plot Dummy	0.17***	0.09***
	(8.29)	(4.08)
SRO Fixed Effects	Yes	Yes
Location Fixed Effects	Yes	Yes
Number Of Observations	16,593	17,543
Adjusted R-square	0.46	0.46

'***' significance at 99% and '** denotes significance at 95%.

(t-stats in parentheses)

Some robustness checks are necessary to be certain that the impact that is observed is attributable only to the changes in stamp duty and guidance value. To this end, three different robustness tests are considered.

The first one is a seasonality check whereby the post-event window is compared with a similar calendar period in the previous year. The analysis is based on two event windows, where post- stamp duty decrease event window is compared to the same window in the prior year. The under-reporting measures for the period of 01st May 2012 to 01st July 2012 is compared to the under-reporting in the period from 01st May 2011 to 01st July 2011; similarly the event windows for seasonality analysis for guidance value changes takes into consideration the prior year window from 12th September 2012 to 11th November 2012 in comparison to the period between 12th September 2013 to 11th November 2013, the guidance value change period. Table 4 captures the seasonality check and it is indicative that under-reporting measures are significant in both cases. Unfortunately, this test, while confirming the decrease in under-reporting, may be compromised due to a GV change that occurred just before the May 2011 period. The under-reporting measure for May 2011-July 2011 has not baked in the impact of the April 2011 guidance value change.

We also calculate the same coefficient in a multivariate fixed effect model to account for changes in the mix of properties. The multivariate analysis with fixed effects for location and SRO offices is shown below and confirms that the impact of Guidance values changes is higher than that of Stamp duty decrease.

Table 7 : Seasonality check

	Event 1 (Stamp Duty Decrease)				Event 2 (GV Increase)			
	Pre (1st May-1st Jul 2011)	Post (1st May-1st Jul 2012)	Diff	T-stat	Pre (12th Sep-11th Nov 2012)	Post (12th Sep-11th Nov 2013)	Diff	T-stat
Under-reporting measure	1.4814	1.1779	-0.303***	-16.66	1.3513	1.2381	-0.113***	-6.07
Adjusted for MV /FE Analysis			-0.034*	-2.88			0.097***	-21.37

'***' significance at 99% and '** denotes significance at 95%.

Another robustness measure is the time trend check, which compares the under-reporting metric to that of an alternative 6 month period where there was no explicit event. For the time trend check, the periods between October to December 2012 and immediate next period between January to March 2013 are compared. The summary under-reporting statistics are presented in Table 8, and on first glance it seems that there is a change in under-reporting measures even without any external regulatory changes. Similar to the prior test, a multi-variate test with fixed effects on location and SRO are added for property mix adjustment and these indicate that in the absence of guidance value changes or stamp duty changes, under-reporting does not substantially differ with time.

Table 8: Trend check

	No Event			
	Pre (Oct-Dec 2012)	Post (Jan-Mar 2013)	Diff	T-stat
Under-reporting measure	1.3306	1.4668	0.1361***	6.76
Adjusted for Multi-variate and fixed effects		-0.0037		-0.48

'***' significance at 99% and '** denotes significance at 95%

A third robustness check is to compare pre-event window with the quarter after the post-event window (allowing market response to settle).

Table 9: Reversal check

	Event 1 (Stamp Duty Decrease)				Event 2 (GV Increase)			
	Pre (Jan-Mar 2012)	Post (Aug-Oct 2012)	Diff	T-stat	Pre (May-Jul 2013)	Post (Dec 2013-Feb 2014)	Diff	T-stat
Under-reporting measure	1.2977	1.2919	-0.0058	-1.28	1.445	1.178	-0.266***	-14.94
Adjusted for Multi-variate and fixed effects			-0.0065*	-1.99			-0.054***	-7.49

'***' significance at 99% and '** denotes significance at 95%.

The reversal test indicates the effect of persistence of the impact. As observed, persistence is higher by atleast ten times for guidance value changes with under-reporting measures staying contained even one quarter after the intervention.

These robustness checks account for the impact of seasonality, for reversal and time checks, but do not account for the reason why stamp duty decrease is less effective than guidance value changes.

Stamp duty decrease is also touted as a measure to encourage registration of properties which would otherwise not be registered due to higher cost. Reducing stamp duty, according to Alm et al(2004) brings more properties into the registration net. To analyse this further we separate the sample into two sub-sample sets, locations with high value gap in guidance values and locations where guidance value has already been pegged close to the market values. Typically, guidance value gap is lowest in locations close to the city center where there is a larger history of transactions to fall back on, and where commercial leasing, mortgage or insurance on property is higher. Conversely, locations with large agricultural tracts where there is thin transaction depth is likely to have higher guidance value gaps.

The cost to truth telling is higher in locations where there is lower guidance value gap (low cost to truth telling) vs high guidance value gap (high cost to truth telling). If decreasing stamp duty increases the registration net, we expect to find a more truth telling in properties where guidance value gaps are higher compared to low-cost-to-truth properties. Evidence does not support this. We find that truth telling does not change substantially between high and low guidance value gap properties when stamp duty is decreased, whereas correcting guidance values increased truth telling in properties with significant guidance value gap as expected. The results are published in Table 10.

Table 10: Cost to truth telling

Low cost

	Event 1 (Stamp Duty Decrease)				Event 2 (GV Increase)			
	Pre (Jan-Mar 2012)	Post (May-Jul 2012)	Diff	T-stat	Pre (May-Jul 2013)	Post (Sep-Nov 2013)	Diff	T-stat
Under-reporting measure	0.8244	0.7383	0.0861**	2.06	0.8524	0.7533	0.099**	2.50

High cost

	Event 1 (Stamp Duty Decrease)				Event 2 (GV Increase)			
	Pre (Jan-Mar 2012)	Post (May-Jul 2012)	Diff	T-stat	Pre (May-Jul 2013)	Post (Sep-Nov 2013)	Diff	T-stat
Under-reporting measure	1.4631	1.4137	0.0494	1.81	1.5977	1.4367	0.161***	4.76

Fixed Effect Regressions (t-stats in parentheses)

Dependent Variable →	Under-reporting Measure	
	Event 1 (Stamp Duty Decrease)	Event 2 (GV Increase)
Intercept	0.65**	-1.09***
	(2.02)	(-3.10)
Stamp Duty Change Dummy	0.02	
	(0.63)	
Guidance Value Change Dummy		-0.70***
		(-15.78)
Time Trend	-0.01	0.11***
(Months from sample beginning)	(-1.44)	(11.28)
Area (in sq.ft $x10^7$)	-2.66	58.6***
	(-0.24)	(3.57)
Vacant Plot Dummy	0.17***	0.09***
	(8.29)	(4.08)
SRO Fixed Effects	Yes	Yes
Location Fixed Effects	Yes	Yes
Number Of Observations	16,593	17,543
Adjusted R-square	0.46	0.46

'***' significance at 99% and '** denotes significance at 95%.

Results

The study indicates that 1.oth policy tools *increase* truthful reporting (and thereby increase government revenues) immediately. While the impact of stamp duty is to do with the number of properties registered and by widening the tax net on registered properties, the guidance value change impacts revenues through better price discovery on the registration value. From a truth-telling perspective, a change in guidance values similar to all presumptive taxations, has *twice* as much and a more *permanent* effect than the effect caused by stamp duty reduction on truth telling. Buyers are *more likely* to self-report truthfully when the *cost* of such reporting (higher tax burden) is *low*Despite these aggressive government interventions to increase truthful reporting in recent years, there is *extensive under-reporting* (>100 percent) in property markets. There is a significantly higher drop in under-reporting due to a change in guidance value which is much higher compared to a decrease in stamp duty. In fact, though the stamp duty measure is insignificant, the positive value indicates there is a *decrease* in truth telling because of stamp duty decrease. Our hypothesis is that the stamp duty decrease widens the tax net and incentivises more people to register their property willingly, but these properties have a higher degree of under-reporting than average,

The above results indicate that a decrease in stamp duty does not incentivise buyers to register at a truthful transaction value. This is contrary to received wisdom from the World Bank and from Alm et al (2004), where decrease in stamp duty is expected to increase the truth-telling and thereby increase

tax collection. Our study shows that decreasing stamp duty influences the volume of registration, but not the truth telling on property transaction prices. This could be attributed to weak enforcement and tax administration: however, where such lacunae in tax administration exist, governments are better off identifying policy measures such as regular update of guidance value to shore up their tax collections.

In effect both stamp duty and guidance value changes are needed. Stamp duty decrease incentivises property owners to register willingly, and guidance value increase reduces the under-reporting due to presumptive taxation.