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The Performance of VAT in DGD-partner Countries[1]

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List of acronyms

Abbreviation	Explanation
BeFinD	Belgian Policy Research Group on Financing for Development
CPIA	Country Policy and Institutional Assessment
DGD	Directorate-general Development Cooperation and Humanitarian Aid
DRM	Domestic Resource Mobilization
GDP	Gross Domestic Product
GNI	Gross National Income
IMF	International Monetary Fund
IMF WoRLD	IMF World Revenue Longitudinal Data
INE	Instituto Nacional de Estadística (Bolivian national statistical institute)
IVA	Impuesto al Valor Agregado (VAT tax)
RMCD	Royal Malaysian Customs Department
SIN	Servicio de Impuestos Nacionales (Bolivian national tax services department)
VAT	Value Added Tax
WB	World Bank
WDI	World Development Indicators Data

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Abstract

This study presents a case study on the value added-tax (VAT) with the objective to design appropriate policies aiming to improve domestic-resource mobilization in developing countries. Data from 18 DGD-partner countries[2] (past and present) over the 1990-2012 period show that, although the performance of VAT has inproved in recent years, many of these countries can close their resource gap by implementing reforms that improve the efficiency of their VAT system. We present an in-depth analysis on Bolivia to illustrate how such reforms could be designed. Bolivia is also an interesting case since the country was one of the first developing countries to adopt VAT in a context characterized by socio-economic and political challenges. We argue that the credibility of the Bolivian government as well as the institutional design of its tax system were very important for the success of their tax reforms. Moreover, we show that the improvement of both the policy and compliance gaps have contributed to the reduction of Bolivia's VAT gap in recent years, but improvements in compliance gap are the main deriver.

JEL Classification: O54, N16, N26, H21, H26, K34

Keywords: Value Added Tax, Tax gaps, Tax Efficiency, Tax Compliance, Tax Law, Bolivia

[2] The list of DGD partner countries has been changing overtime, which follows changes in developmental and diplomatic priorities of Belgium and also the economic trends of its partner countries. For instance, some old partner countries such as South Africa, Vietnam, Peru, and Ecuador have become relatively robust middle income countries in recent years. On the other hand, the needs for development assistance have become relatively more important in some countries such as D.R. Congo and Burundi. The more recent list of DGD partner countries can be found here: http://diplomatie.belgium.be/en/policy/development_cooperation/where_we_work/partner_countries

1 | Introduction

Given the dual reality where poor countries greatly need funds for their development projects and the fact that many of them display low-tax collection, it becomes relevant to identify the sources of inefficiency within their tax system. Among tax instruments, VAT is one potential candidate that developing countries should prioritize in order to improve their domestic resource mobilization (e.g. Keen, 2008; Boadway and Sato, 2009; Le, 2003, Zidkova, 2014; Paz, 2015). To begin with, VAT is relatively easy to administer and as a result less prone to tax evasion. VAT facilitates the detection of non-compliances since it is charged on the 'value-added', through the production chain, and usually involves various bills and proofs of payments. In this sense, VAT is argued to be 'self-policing' (Bird and Gendron, 2006; Le, 2003; and Lin, 2008). Furthermore, it is especially suitable for developing countries since VAT is relatively less sensitive to the informal market and, if well designed, it can even be used as a tool to reduce the size of the informal sector (Boadway and Sato, 2009). In addition, VAT is also conceivably one of the least distortionary taxes (Kneller et al., 1998). For instance, in comparison with income taxes, VAT does not change consumption decisions relative to savings and investment decisions. Likewise, in comparison with other consumption taxes, VAT does not cause cascading effects (i.e. tax on a commodity is charged at separate stages of the production process without deductions) since sellers, or firms paying VAT, can receive credit for the VAT paid up on their intermediate inputs.

As such, VAT is referred to as a 'money machine' because its adoption has helped various countries to improve their tax-revenue collection (see Keen and Lockwood, 2006 and 2010 for the pioneered contribution on the money machine hypothesis and Houssa and Megersa, 2017, for a recent empirical analysis).[3] Indeed, starting with its first introduction in France in 1954 (Ernst and Young, 2015), VAT is currently adopted by most countries around the world (over 160 countries), see Figure 1 below.[4]

In this paper we aim to empirically identify the sources of inefficiency of VAT systems in developing countries. The general performance of a VAT system is examined by an indicator known as 'VAT gap' (given as the inverse of an indicator known as C-efficiency which measures the efficiency of VAT). The VAT gap is defined as the difference between 'potential VAT revenue' and the VAT revenue that a country has 'actually' been able to collect during a particular period of time (Reckon, 2009; Keen, 2013; Zidkova, 2014). The higher the VAT gap (the low the C-efficiency is), the less efficient is the tax system and, thus, necessary reforms should be designed to reduce this gap.

The analysis proceeds in two steps. First, we give estimates of the evolution of the VAT gap for 18 DGD-partner countries in 1990-2013. Whereas VAT gap is a useful indicator to evaluate the potential revenue leakage (and a metric to compare countries with eachother), it may not necessarily give a detailed picture of the tax evasion in a country and in which particular sectors the problem is acute.[5] Therefore, in the second step, we decompose the VAT gap in to two useful terms: the 'compliance gap' and the 'policy gap'. The compliance gap captures inefficiencies related to imperfect implementation of VAT whereas the policy gap reflects those

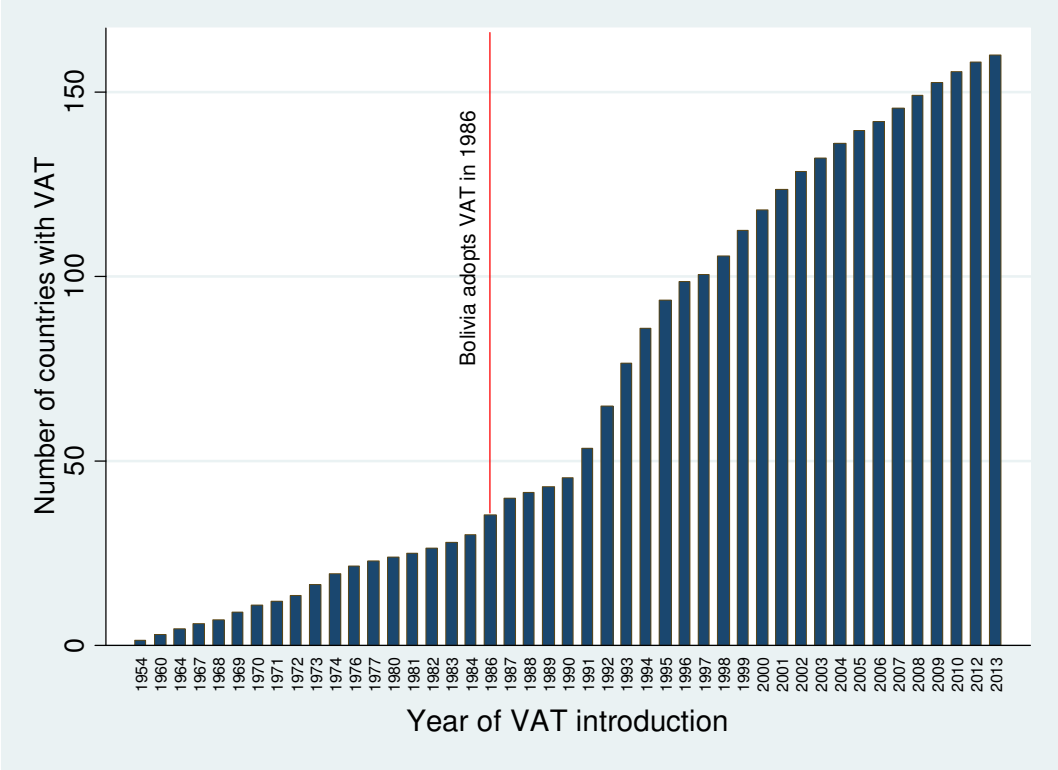
[3] However, VAT is sometimes criticized for potentially having a 'regressive' tendency, since it is an indirect tax by its very nature (McGowan and Billings, 1997; Jenkins et al., 2006; Bird and Gendron, 2007; Ebrill et al., 2001; Arsic and Altiparmakov, 2013). Theoretically, the most efficient VAT system is a single VAT rate that is applied to the broadest possible consumption base (Ebrill et al., 2001; Borselli et al., 2012; Keen, 2013). This would essentially be a proportional tax on consumption. However, VAT would be regressive if this was the case since those economic agents -such as the poor - with bigger share of consumption (proportional to their income) would end up paying more VAT. To overcome this problem, the legal VAT codes of many countries introduce multiple rates and also exemptions for different consumption items. Since exemptions make the VAT base narrow, their coverage is often limited to basic consumption items such as food, health care products and education related spending that tend to particularly be sensitive areas for the vulnerable groups of the society. This is important for policy makers as these consumption items are where the poor often spend much of their disposable income. However, such measures (although introduce equity in to the tax system) can also introduce inefficiency in to VAT - especially when the rate differentiations and exemptions are not carefully done and properly enforced for lack of strong administration capacity. Given the weak state of tax bureaus in many developing countries, this might contribute to tax evasion and, thus, greater VAT (compliance) gap

[4] Figure 1 shows that most countries in the world have by now adopted VAT. In particular, starting with France in 1954 VAT has been introduced in other developed countries in the 1960s and 1970s. Thereafter, the number of VAT adopters increased tremendously in the late 1980s and early 1990s with developing countries. Today there are more than 160 VAT adopter countries of which are over 100 developing countries.

[5] As Zidkova (2014) notes, high and growing VAT gap might be an indicator that the tax administrative apparatus in a country is not efficient. Such a revenue gap should, therefore, gain the attention of governments in general and tax authorities in particular.

associated with the design of the VAT system. We further decompose the policy gap in two terms: the gap related to VAT-rate differentiations; and the gap due to exemptions. For the second step of the analysis, data limitation forces us to focus on Bolivia, which is also an interesting case to illustrate how reforms can be designed to improve VAT efficiency. Moreover, the country is among the developing nations that adopted VAT early on, in a context characterized by socio-economic and political challenges.[6]

Figure 1: Cumulative number of VAT adopter countries



Source: using data from Ernst and Young (2015) and RMCD[7]

For the purpose of the analysis we make use of different datasets. For the cross-country analysis , we benefited from a global C-efficiency database shared with us by the IMF staff[8] as well as the IMF World Revenue Longitudinal Data (WoRLD) and the ICTD Government Revenue Database. VAT rates are taken from Ernst and Young Worldwide Tax Guide and other sources (see sources under Table 1). To carry out a detailed decomposition of the VAT gap for Bolivia we use tax data from the Bolivian national tax services department 'Servicio de Impuestos Nacionales (SIN)' as well as input-output data from the national statistical institute. Our analysis on the Bolivian VAT gap focuses on the 1990 - 2012 period.

[6] As Reckon (2009), Ligthart (2007) and Zidkova (2014) note, the presence of more effective legal and judicial apparatus leads to increased VAT compliance, thus lower VAT gap. This is evident as countries with good judicial systems could better enforce tax obligations. Similarly, this also raises the confidence of tax payers in the system (e.g. they could hold tax authorities accountable if they feel their tax payments are unfair). Various country specific characteristics are going to determine the effectiveness of tax instruments such as VAT. As the evidence from various empirical works show (e.g. econometric panel estimates for diverse determinants of tax revenue such as Keen, 2006; Martinez-Vazquez and Bird, 2011; Keen and Lockwood, 2010; and Ahlerup et al., 2015 as well as estimates of VAT efficiency and 'VAT gaps' such as by Aizenman and Jinjarak, 2005; Reckon, 2009; Zidkova, 2014; Hutton et al., 2014; Cnossen, 2015). Some of these important characteristics include: the size of the informal sector, the overall level of corruption, the degree of development of a country, size of dependent population, etc.

[7] VAT adoption dates and current rates for countries of the world are available in Ernst and Young (2015) and RMCD website http://gst.customs.gov.my/en/gst/Pages/gst_ci.aspx

[8] The data '*Collecting Taxes 2011/12*' was provided to us by IMF staff (Phillipe Wingender and Eric Hutton). We are grateful for their assistance. This data is also used in the IMF report "Hutton, E., Thackray, M. and Wingender, P. (2014) Revenue Administration Gap Analysis Program—The Value-Added Tax Gap: Uganda, International Monetary Fund, Fiscal Affairs Department."

The data show that the efficiency of VAT has improved in several countries in recent years. Among the best performers (e.g. Bolivia, Ecuador, South Africa, Vietnam) Bolivia and Vietnam stand out. For instance, the top performer country Vietnam displays a strong improvement in VAT effciency from about 57% in 1999 to nearly 90% in 2008. In the same way, the VAT gap in Bolivia decreased substentially from over 65% in 1990 to about 20% in 2013. On the contrary, governments of many DGD-partner countries could mobilize more resources by improving the efficiency of their VAT system. For instance, VAT gaps in countries like Benin, Burkina Faso, Burundi, DRC, Niger, Mali, Rwanda, and Uganda still stand in excess of 60% in recent years. In other words, these countries are not able to collect even half of the VAT revenue that is potentially collectible. These significant inefficiencies relating to VAT collection emanate partly from compliance problems (where VAT payers don't pay VAT as required by the tax code) and/or due to the design of the VAT tax code itself (where there are wide ranging loopholes involving exemptions or rate differentiations). An in-depth country case study is thus necessary to identify where the gaps lie.

From the in-depth case study on Bolivia (where we analyze the VAT gap across different sectors and also document series of tax reforms), we argue that the credibility of the government, the quality of institutions and the design of the tax system are important elements of a successful tax reform. Moreover, we show that improvement of both the 'policy' and 'compliance' gaps have contributed to the reduction of Bolivia's VAT gap in recent years. However, improvements in closing the compliance gap have been the main drivers of rising efficiency in VAT revenue.

The rest of this paper is organized as follows. In Section 2, we discuss the measurements of VAT efficiency. In Section 3 we briefly assess the VAT gap in DGD-partner countries. In Section 4, we provide an in-depth case study on VAT gap in Bolivia. First, we discuss the history of VAT reforms in Bolivia. We also discuss the specific fiscal, political and other institutional settings under which the country undertook the reforms. Then, we discuss estimates for the VAT gap and its decomposition for Bolivia. Section 5 presents concluding remarks and policy recommendations.

2 | Measurements of VAT performance

2.1 Background

There are two main ways to calculate VAT efficiency: the 'top-down' approach and the 'bottom-up' technique (Reckon, 2009). The 'top-down' method uses macroeconomic statistics from national accounts to calculate VAT liability (i.e. the VAT revenue that is collectible in theory) and then checks how this compares to the VAT receipts that are actually collected. The 'VAT liability' depends on the final consumption of households and non-profit organizations, which often encompasses the larger chunk of VAT receipts (Reckon 2009; Zidkova, 2014). In addition, information from intermediate consumption and gross fixed capital formation of companies (except for those with VAT exemptions and deductions) are taken into account in the computation of VAT liabilities. Therefore, input VAT (charged on various stages of the production process) is included in gross 'theoretical' VAT liability (Reckon, 2009).

Given its simplicity, this 'top-down' approach has been widely used across countries. For instance, VAT gaps have been tracked using this method by tax administrations in various countries including UK, Sweden and Slovakia (Hansson and Wallberg, 2008; HMRC, 2011; Novysedlak and Palkovicova, 2012; Zidkova, 2014). In the same way, Reckon (2009), has employed this method for 25 EU member states. However, one important limitation of this method is the need to get reliable macroeconomic data. Otherwise, the computation of the VAT gap (specially the calculation of VAT liability - which is determined from macro-aggregates) might be swayed by errors in the national accounts data. Furthermore, a more accurate calculation of VAT liabilities

requires consumption data for various taxable items, for which the VAT rate sometimes varies. There will be various products and special economic agents (vulnerable economic groups such as the poor or strategic firms) that receive VAT exemptions. The presence of such complexities in the tax codes of most countries (involving deductions and exemptions to the standard VAT rate), makes the precise computations of 'VAT gap' with the top-down method daunting. Coming up with detailed breakdowns of consumption statistics (i.e. disaggregated VAT liabilities) and VAT receipts by specific product groups (i.e. actual VAT receipts) is even more challenging in developing countries. The task of decomposing 'VAT gap' into specific sectors and product groups especially requires reliable and harmonized input-output tables (i.e. consumption disaggregates) and VAT revenue statistics (see exemplar sectoral VAT gap decompositions for Bolivia in Tables C1 to C4 in Annex).

The 'bottom-up' method, as could be inferred from the name, uses microeconomic data to construct VAT gap. The approach uses data from specific (representative) firms and extrapolates it to arrive a theoretical VAT liability estimate for the whole economy. The kind of data used in this approach might be pooled from firm surveys, other existing studies, or various tax registers gathered from national revenue bureaus. This approach is implemented in countries such as the US, UK and Sweden (Zidkova, 2014).

Some countries use both the 'top-down' and 'bottom-up' approaches simultaneously so that they can supplement each other. However, the use of the 'bottom-up' approaches is often witnessed in studies done by tax authorities (and not in the academic literature). This is due to the difficulty in obtaining adequate and representative data for such a study. However, when possible - the combination of the two approaches will yield a more accurate depiction of the magnitude (and sectoral structure) of VAT gaps and tax evasions. In this study, data limitation forces us to concentrate on the to-down approach.

2.2 Decomposition of VAT Revenue[9]

Following Keen (2013) we decompose the revenues from VAT (to GDP ratio) in country 'i' at year 't', $\frac{V_{it}}{GDP_{it}}$, as:

$$\frac{V_{it}}{GDP_{it}} = \tau_{it}^{c} E_{it}^{c} \frac{C_{it}}{GDP_{it}}, \qquad (1)$$

where, $\tau_{s_{it}}$ represents the standard VAT rate, E_{it}^{c} denotes the efficiency of VAT also known as C-efficiency, and, $\frac{C_{it}}{GDP_{it}}$ represents final consumption to GDP ratio. Eq. 1 indicates that changes in any of the three terms (VAT rate, C-efficiency; and consumption) will affect VAT-revenue collection. Note also that the three factors might even have offsetting effects upon each other. For instance, a slower economic growth and aggregate consumption (thus lower VAT revenues) might be counterbalanced by a simultaneous rise in C-efficiency. Further, a rise in the standard VAT rate with the intention of increasing VAT revenue might backfire and result in even smaller VAT revenue by indirectly forcing economic agents into the informal economy (Loayza, 1996; Keen, 2008; Paz, 2015). Therefore, such a decomposition of VAT revenue to these three major subcomponents would be very helpful to the tax authorities. They could monitor the state of the revenue collection process in detail (and the state of the economy at large) to undertake sensible policies and better prepare beforehand by monitoring movements in the individual VAT components.

Rewriting Eq.1 yields the C-efficiency:

9 This section is mainly based on Keen (2013) to which we refer to for additional exposition

$$E_{it}^{c} = \frac{V_{it}}{\tau_{it}^{c} C_{it}}, \qquad (2)$$

which represents the ratio between the amount of VAT actually raised to that of the VAT amount which would have been raised in the 'ideal scenario' in which VAT is perfectly enforced by the country, and if the VAT was levied at a uniform standard rate (τ_s) on all consumption.[10] This is formulae we use to estimate VAT efficiency across the 18 DGD-partner countries.

2.3 Expanding the specification of C-efficiency

Ease of computation, minimal data requirement and possibility to perform a cross-country analysis, make C-efficiency an appealing measure for VAT's efficiency. However, this measure is not good at capturing some of the gaps within the VAT system. For instance, its solid assumption of 'perfect enforcement of the standard VAT rate' makes it detached from reality, as countries often have wide ranging exemptions and rate differentiations in their legal tax codes. Furthermore, there are various social goals that legitimize these exemptions and rate differentiations. This relates to the redistributive role of tax (e.g. items consumed more by the poor should be taxed less) and the punitive or supportive role with regard to certain consumption items (e.g. discouraging alcoholic drinks and cigarettes vs. encouraging exports). Due to such complexities of actual tax codes, we need to introduce alternative measures (mechanics) that better capture VAT efficiency.

In order to incorporate exemptions and the different actual rates charged on various classes of consumption items we assume that the economy of country i includes $N + 1$ goods, where the first N are commodities that are traded on the market and consumed by households while the remaining is a public good which is not taxed. Taking into account these changes we can restate Eq. 2 as:

$$E_{it}^{c} = \frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}^{*}}{\tau_{it}^{c} (\sum_{k=1}^{N+1} C_{kit})}. \qquad (3)$$

2.4 Decomposing VAT gap

VAT gap can be decomposed in two components: the *policy gap*; and the *compliance gap*. The 'policy gap' P emanates from the fact that VAT is rarely implemented on a uniform rate on all consumption. As we noted above, there are various exemptions and deductions in the legal tax codes of many countries. Keen (2013) refers to this as the 'policy gap'. It captures the impact of the deliberate policy amendments made (by the government or tax authorities) to the standard VAT rate applied to various classes of taxable items. This policy gap will assume a value of zero in the 'world' where the VAT is applied to all consumption at a single uniform rate (τ_{it}^{c}).

On the other hand the *compliance gap* Γ originates from the imperfections in the implementation of the existing VAT system. In particular, it captures the amount of VAT liabilities that were not collected due to tax non-compliance. It basically captures what is left of the uncollected VAT liabilities that cannot be explained by the 'policy gap'. This gap will be zero if the VAT is perfectly implemented.
Using our foregoing notations, we can capture these two gaps by first expanding C-efficiency in Eq. 3 above as:

[10] The enforcement of VAT at a uniform rate across the economy assumes an 'ideal scenario' where there would be no exemptions or VAT rate deductions for various classes of products or economic agents. Therefore, C-efficiency serves more like a rough guide to VAT's efficiency. In general, developing countries (with their 'relatively' bigger informal sectors, tax loopholes, weak institutions and enforcement capacities) score lower on C-efficiency when compared to wealthier countries.

$$E_{it}^{c} = \left(\frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}^{*}}{\tau_{s_{it}} \left(\sum_{k=1}^{N+1} C_{kit}\right)}\right)\left(\frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}^{*}}{\sum_{k=1}^{N+1} T_{kit}^{*} C_{kit}}\right) \quad (4)$$

If we simplify the two major right hand side products of Eq. 4 as;

$$E_{it}{}^{C} = (1 - P)(1 - \Gamma) \quad (5)$$

where

$$P = 1 - \left(\frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}}{\tau_{s_{it}} \left(\sum_{k=1}^{N+1} C_{kit}\right)}\right) \quad \text{and} \quad \Gamma = 1 - \left(\frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}^{*}}{\sum_{k=1}^{N+1} T_{kit}^{*} C_{kit}}\right) \quad (6)$$

The 'policy' and 'compliance' gaps serve as good indicators of the inefficiency of VAT systems around the world (Borselli et al., 2012; De Mooij and Keen, 2012; Keen, 2013; Hutton et al., 2014). The other (practical) aspect of these two measures is the fact that they can be determined with 'relative' ease. In particular, knowing the value of C-efficiency and the policy gap one can easily estimate the compliance gap as a residual. This is especially helpful for our analysis of the VAT gap and inefficiency in developing countries where it is rather hard to determine or estimate the extent of the 'compliance gap'. We further decompose the 'policy gap' into various aspects of VAT imperfection that are rooted in its design (thus 'policy gap') rather than in its implementation (i.e. 'compliance gap'). Specifically, we may rewrite Eq. 6 to better capture other distinct gaps within the 'policy gap'. Using similar notations as before;

$$1 - P = \left(\frac{\sum_{k=1}^{N} T_{kit} C_{kit}}{\tau_{s_{it}} \left(\sum_{k=1}^{N} C_{kit}\right)}\right)\left(\frac{\sum_{k=1}^{N} C_{kit}}{\sum_{k=1}^{N+1} C_{kit}}\right)\left(\frac{\sum_{k=1}^{N} T_{kit}^{*} C_{kit}}{\sum_{k=1}^{N} C_{kit}}\right) \quad (7)$$

Next, we simplify the above right hand side terms as;

$$1 - P = (1 - r)(1 - x) \quad (8)$$

In this setting, we will be able to capture discrepancy in statutory VAT rates (i.e. the 'rate gap') as;

$$r = \frac{\sum_{k=1}^{N}\left(\tau_{s_{it}} - T_{kit}\right) C_{kit}}{\tau_{s_{it}} \left(\sum_{k=1}^{N} C_{kit}\right)} \quad (9)$$

This reflects the VAT gap that arises from the differentiation between the standard VAT rate and the effective VAT rate charged on various ($C_{k_{it}}, k = 1, \ldots, N$) commodities.

Conversely, once we have the 'policy gap' and the 'rate gap', we may capture the 'exemption gap' as a residual from Eq. 8 as follows:

$$x = 1 - \left(\frac{1-P}{1-r}\right) \quad (11)$$

This reflects the VAT gap which arises due to exemptions. In such a setting (which is done for practical reasons), the rate differentiation is first calculated and the 'exemption gap' is calculated with the 'rate differentiation' being operational.[11]

[11] Again, theoretically it is possible to do this the other way around. That is, first calculating the 'exemption gap' and then the 'rate differentiation' later on derived as a residual from the 'policy gap' and the 'exemption gap'. However, it is much easier to practically proceed the way we stated above (see Keen, 2013 for more on further decomposition of the 'exemption gap').

3 | VAT efficiency in DGD-partner countries

To begin with, Table 1 indicates that all DGD-partner countries have by now adopted VAT. However, some countries did so much earlier than others. In particular, we distinguish three groups. The first group introduced VAT in the 1980s: Bolivia, Ecuador, Morocco, Peru, and Niger, and Senegal. Thereafter, we have countries that adopted VAT in the 1990s. These include: Algeria, Benin, Burkina Faso, Mali, South Africa, Uganda, Tanzania, and Vietnam. Finally is the group of the more recent adopters (Burundi, Rwanda, D.R. Congo, and Mozambique) who introduced VAT from the 2000s onwards.

Table 1: VAT adoption in DGD partner countries (past and present)

DGD partner Countries	Year of VAT adoption	Current VAT rate (%)	VAT Rate at introduction (%)	Region[12]
Morocco	1986 [a]	20 [a]	19 [c 13]	North Africa
Algeria	1992 [b]	17 [b]	21 [f]	
Burkina Faso	1992 [d]	18 [b, d]	18 [i 14]	West Africa
Mali	1991 [b]	18 [b]	17 [c]	
Niger	1986 [c]	19 [b, d]	12 [c 15]	
Senegal	1961-80 [c 16]	18 [b]	20 [c]	
Benin	1991 [b, d]	18 [b, d]	18 [j]	
DRC	2012 [b, d]	16 [a, d]	16 [k]	Central Africa
Rwanda	2001 [b, d]	18 [a]	18 [L]	
Burundi	2009 [b, d]	18 [b, d]	18 [m]	
Uganda	1996 [b, d]	18 [b, d]	18 [n]	East Africa
Tanzania	1998 [b, d17]	18 [b, d]	20 [h 18]	
Mozambique	1999 [e]	17 [b, d]	17 [e]	
South Africa	1991 [a, b, d]	14 [a, b, d]	10 [o 19]	Southern Africa
Ecuador	1981 [a, b]	12 [a, b]	4 [c 20]	Latin America
Peru	1991 [a, b]	18 [a, b]	20 [c 21]	
Bolivia	1986 [a, b]	13 [a, b]	10 [c]	
Vietnam	1999 [a, b]	10 [a, b]	10 [p]	Asia

Source: a Ernst and Young (2015); b RMCD (2016)[22]; c Tait (1988) ; d Crowe Horwath (2016); e Due (1999); f Deloitte (2016); g Mansour (2015); h KPMG (2016); i OECD (2013); j IMF (1996);

In order to understand the link between VAT adoption and tax collection in DGD-partner countries, Figure 2 reports the average revenues derived from overall taxes together with those from VAT between 1990 and 2013. First, the data show a great degree of heterogeneity across DGD-partner countries. Tax collection ranges from a low value of 5% of GDP in DRC to a high value of 33% in Algeria. Algeria is, however, an outlier because a large part of its revenue (about 67%) is levied on activities related to hydrocarbons (IMF, 2014).

12 The list of DGD partner countries is taken from the DGD Annual report "summary 2014". See DGD (2014)

13 The VAT rate was raise from 19% to 20% in Morocco in 1996.

14 The flat (single) VAT rate was effective as of 1996.

15 Tait (1988) reports that the VAT rate was 25% by January 1991.

16 The 20% VAT rate refers to the rate in 1991. There are no precise dates available for VAT introduction in Senegal and the tax evolved from limited manufacturer's turnover tax with credits (Tait, 1988).

17 VAT introduction in Tanzania follows the VAT law of 1997 (VAT Act 1997). A new VAT law (VAT Act 2014) has been introduced and is effective from 1 July 2015. The rate currently remains 18%.

18 Tanzania cut the VAT rate from 20% to 18% at the end of 2009.

19 The VAT rate was increased from the original statutory 10 % to 14 % in 1993.

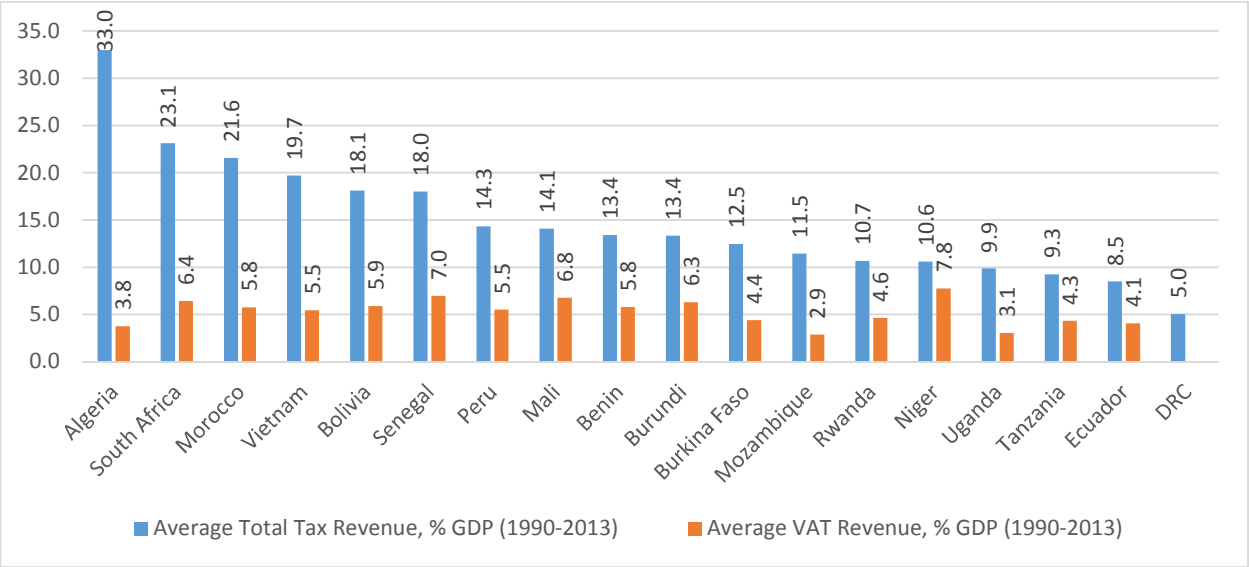
20 Tait (1988) reports a predecessor of current VAT system that was introduced in Ecuador 1970 with rate of 4%.

21 Tait (1988) reports a predecessor of current VAT system that was introduced in Peru 1976 at 20%.

22 VAT adoption dates and current rates for countries of the world are available in Ernst and Young (2015) and RMCD (2016).

Ignoring thus Algeria the best overall-tax performers among DGD-partner countries include Bolivia, Morocco, Senegal, South Africa, and Vietnam, showing an average tax revenue of about 21 % of GDP.

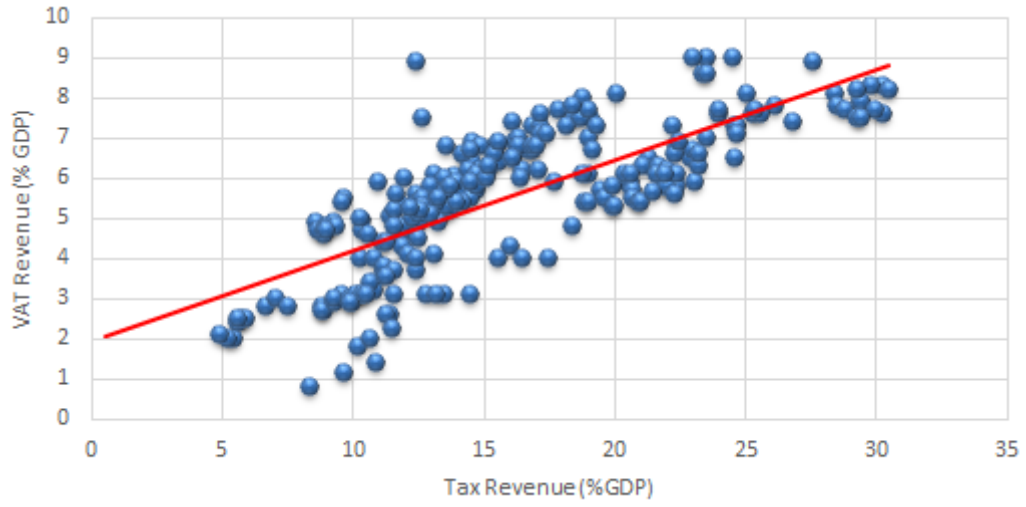
Figure 2: Average Revenues from overall taxes and VAT in DGD-partner countries (% GDP, 1990-2013)



Note: IMF WoRLD data

Second, VAT-revenue collection also differs across countries ranging from about 3% of GDP in Mozambique to about 8 % in Niger. Third, Figure 3 below displays a strong and positive correlation between total tax revenue and VAT revenue. In particular, the correlation coefficient is about 0.8 (excluding the outlier Algeria). This strong correlation suggests that VAT has been an important tax instrument that has significantly contributed to the tax effort in DGD-partner countries. It is consistent with the money machine hypothesis discussed earlier in this study (e.g. Keen and Lockwood, 2006 and 2010 for the pioneered contribution on the money machine hypothesis and Houssa and Megersa, 2017, for a recent empirical analysis).

Figure 3: Correlation between Tax & VAT revenue in DGD-partner countries (1990-2013)

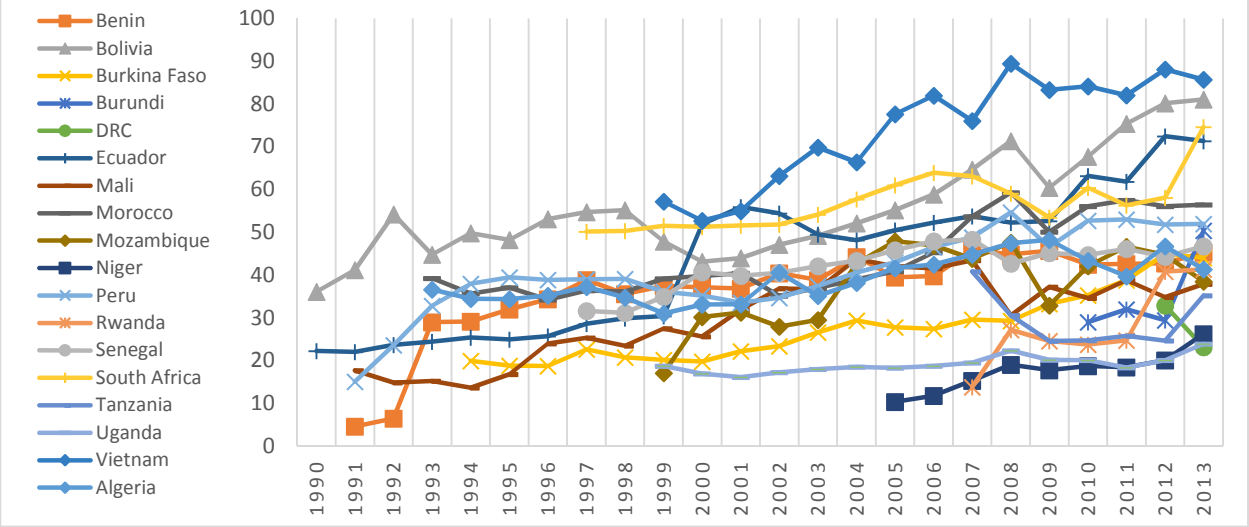


In contrast to VAT revenue (and also the overall-tax revenue) the data reported in Table 1 indicate that the current standard VAT rates are quite similar across countries (with exception of Bolivia, Peru, South Africa and Vietnam). Combining this information together with the three stylized facts discussed above implies that the efficiency of VAT must be different across countries. Figure 4 reports the dynamic performance of VAT efficiency in DGD-partner countries in 1990-2013. We derive two interesting facts.[23]

First, DGD-partner countries perform differently on their VAT efficiency. For instance, VAT gaps appear to be higher in the poorer African countries when compared to South Africa and the more developed Latin American countries. In particular, the gap is relatively more pronounced in Niger, Uganda, D.R. Congo and Mali. Moreover, some of the countries with the lowest VAT gap are also those that display a lower tax rate (e.g. Vietnam, Bolivia, Ecuador and South Africa). However, there are also exceptions where countries with 'relatively' high VAT rate also have low gap (e.g. Morocco and Senegal).

Second, there is a clear positive trend regarding the efficiency of VAT collection in most DGD-partner countries. In recent years, partners such as Bolivia, Ecuador, South Africa and Vietnam have particularly shown marked improvements in C-efficiency. For instance, the top performer country Vietnam displays a strong improvement in VTA effciency from about 57% in 1999 to nearly 90% in 2008. Bolivia appears to be the second-best performer among DGD-partner countries over the 1990-2013 period. VAT collection rose from about 36% of its potential in 1990 to about 81% by 2013. Bolivia has generally witnessed steady improvements in C-efficiency, except for the periods of Bolivian economic crisis in late 1990s to early 2000s and around the 2008-2009 global economic crisis - which also affected other DGD partner countries. In fact, the performance in C-efficiency in most partner countries (with the exception of Bolivia, Ecuador, and Rwanda) has detioriated in the period since the global recession. This could be explained by the slow growth in most countries in this period and the likely decline in VAT revenues. Slow economic growth (and particularly slow consumption growth by firms and individual consumers) translates to slower growth in VAT collection. In the following section, we will explore the Bolivia's experience in detail.

Figure 4: Dynamics of VAT efficiency in DGD-partner countries



Source: using IMF WoRLD[24] data and WB WDI data

[23] The standard VAT rates given in Table 1 are used in the computations of c-efficiency and VAT gaps.

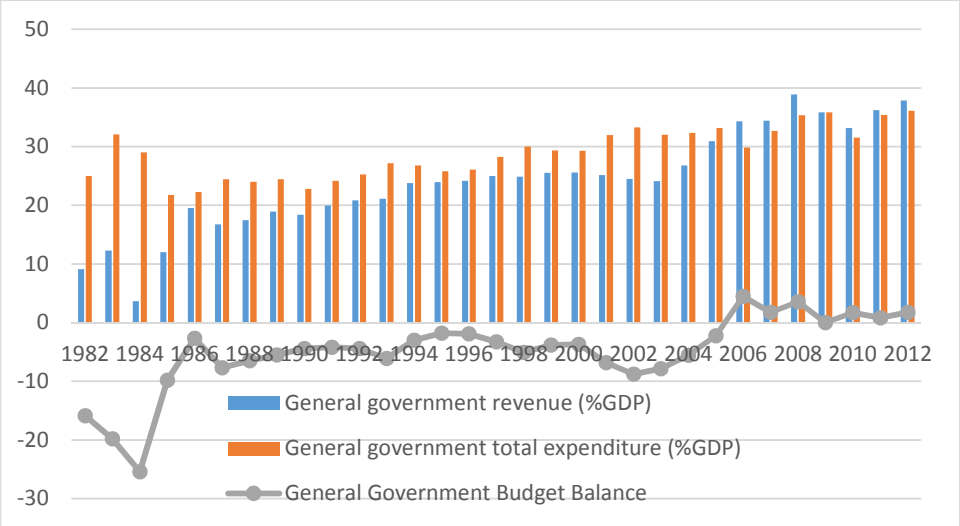
[24] For IMF World Revenue Longitudinal Data (WoRLD), visit http://data.imf.org/revenues

4 | An in-depth analysis of VAT gap: Bolivian case study

4.1 Background: VAT Reforms in Bolivia

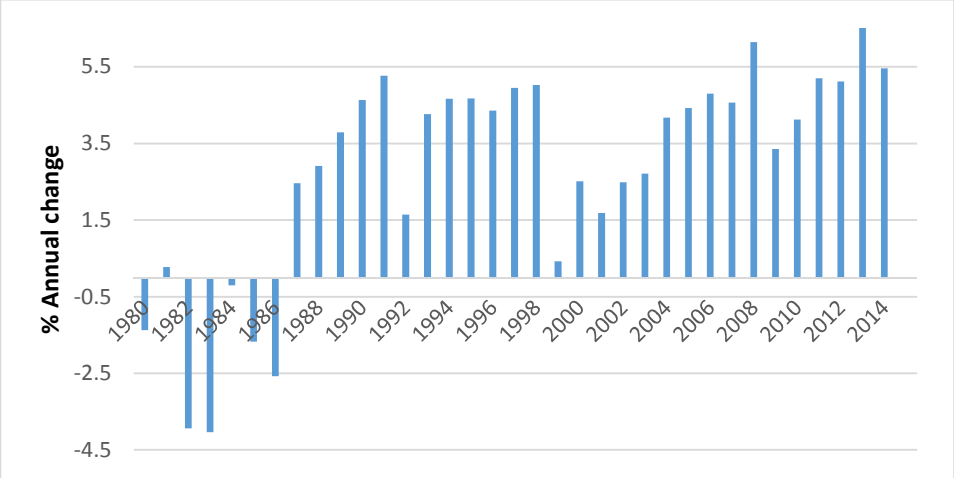
As a developing country, Bolivia has been experiencing the challenges of raising adequate tax revenue to fulfill its socio-economic and development objectives. Following the country's long history of budget deficits and other economic woes (see Figure 5 and 6), Bolivia introduced VAT in 1986.

Figure 5: General Government Revenue, Expenditure & Budget Balance in Bolivia (% GDP)



Source: using data from IMF WEO[25]

Figure 6: GDP growth



Source: using data from WB WDI[26]

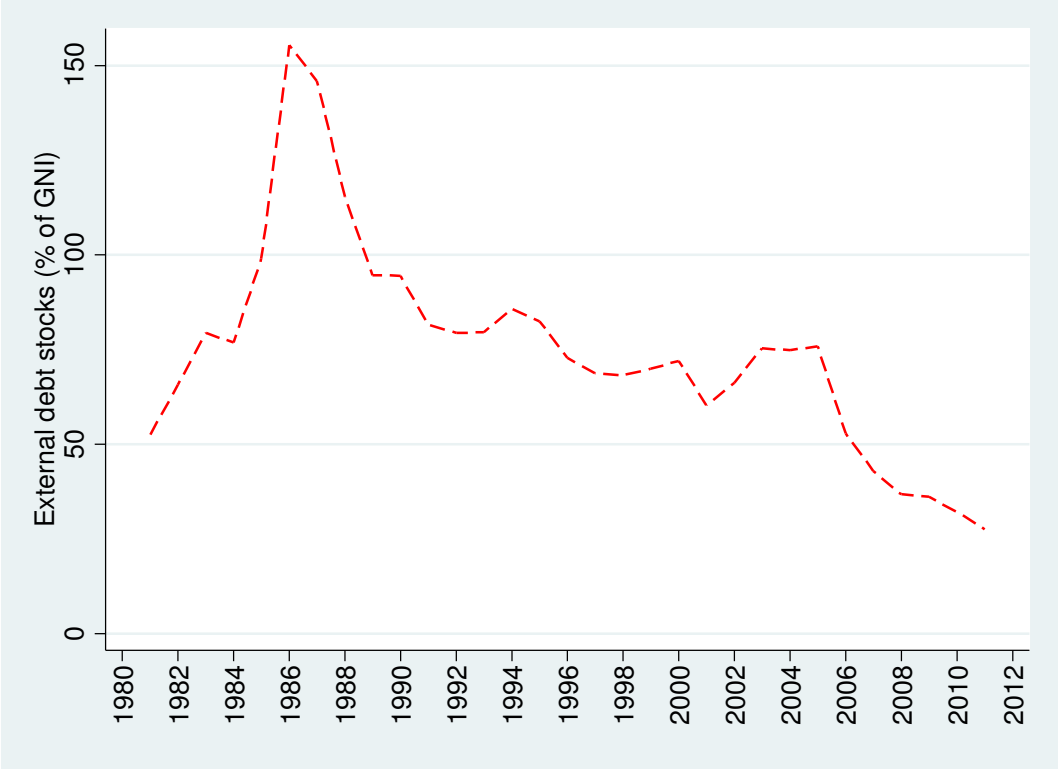
Especially, VAT, which is locally known as 'Impuesto al Valor Agregado (IVA)', was introduced in Bolivia after a bill was approved on May the 20th 1986 under President Victor Paz Estenssoro who won the election

[25] For IMF World Economic Outlook (WEO) data, visit http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/download.aspx
[26] For World Bank World Development Indicators (WDI) data, visit http://data.worldbank.org/products/wdi

in 1985. This makes the country one of the early adopters of the VAT tax instrument, at least among developing countries.

It is important to understand the context in which this reform took place in Bolivia. Public expenditure has been growing since the 1970s to finance the growing employment in the public sector but also to finance expenditures and subsidies in state enterprises. On the contrary, as can be seen in Figure 5, government revenue was very low (below 15% of GDP for much of the early 1980s) and Bolivia financed the deficit with international borrowing. The country's external debt stocks skyrocketed from about 52% of GNI in 1981 to 155% in 1986 (see Figure 7).

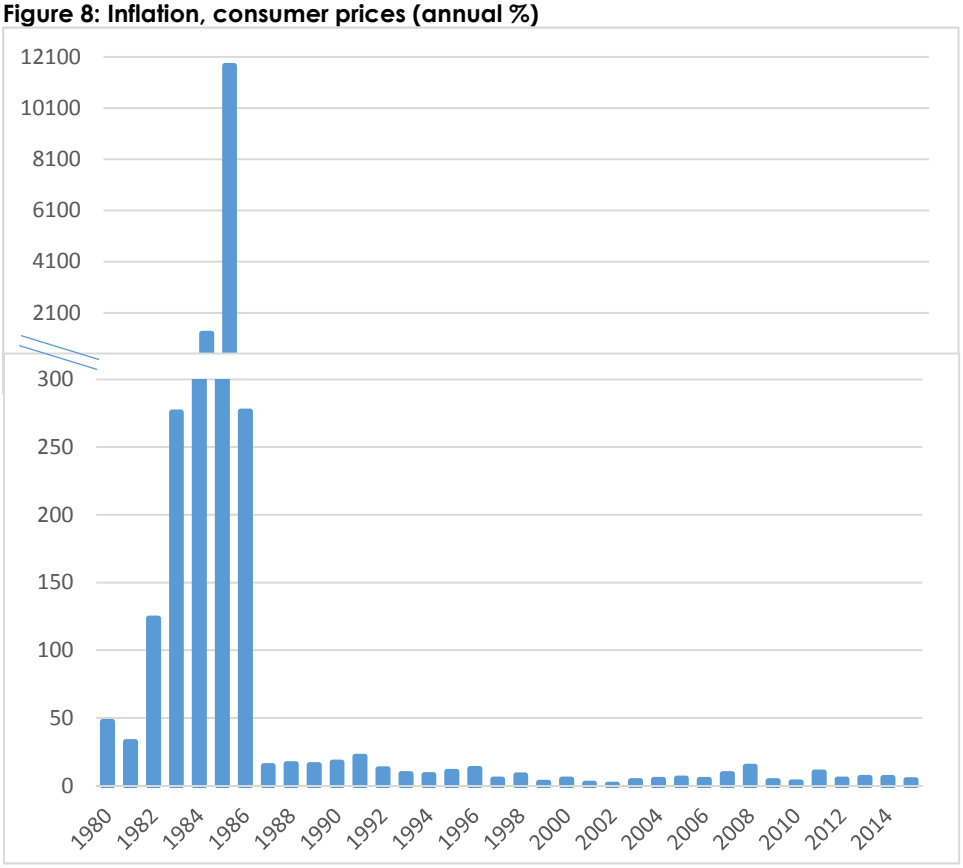
Figure 7: Bolivia's external debt position



Source: using data from WB WDI

Following the default of Mexico in 1982, however, it became difficult for developing countries (especially those in the Latin American region) to borrow from the international capital market. Moreover, the then Bolivian President Siles Zuazo (1982-1985) lacked political support to make the necessary structural reforms aiming to reduce government spending and to increase tax revenue. As a result, Bolivia resorted on printing money to finance the deficit. This policy, however, generated hyperinflation which reached 11,749.6% in 1985. This hyperinflation caused a big damage to the economy and protests led to the election of a new president Victor Paz Estenssoro who came to power in 1985. After his election, Paz initiated a decree that contained a number of measures to cut government expenditures considerably which helped to stabilize the economy and the hyperinflation. As a consequence, the hyperinflation fell considerably to just over 14% by 1987 (see Figure 8).

Figure 8: Inflation, consumer prices (annual %)

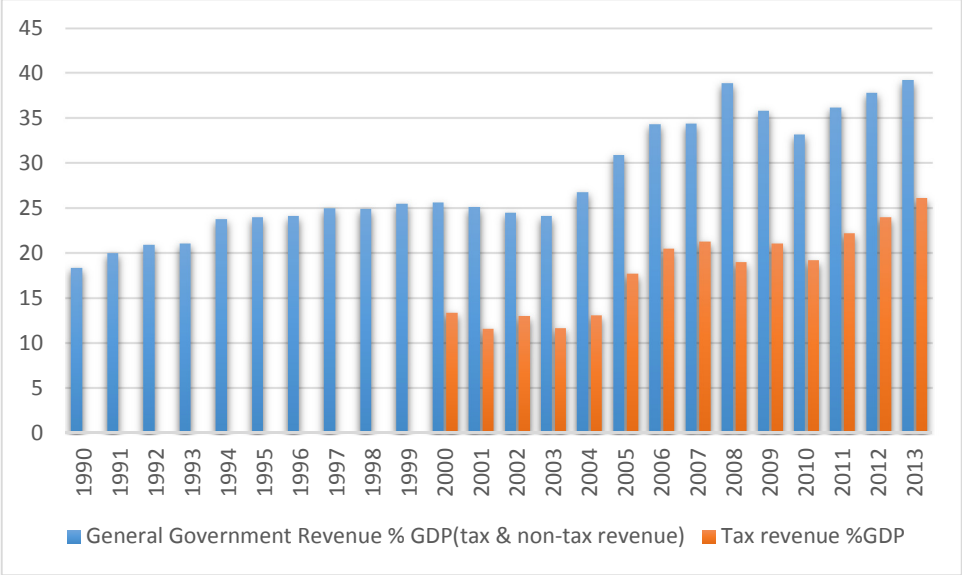


Source: using data from WB WDI

In order to introduce more structural reforms, however, Estenssoro first mobilized and obtained political majority in the congress (84 out of 130). As a result, Paz was able to pass the tax Law 843 in May 1986. This was an important package of tax reforms aiming to simplify a number of existing taxes but also to strengthen the administration of the tax system. For instance, about 400 sales taxes were simplified to a unique VAT rate of 10% and many exemptions were abolished. In the same way, income taxes were replaced by a unique 10% withholding tax which could be reclaimed later. Profit taxes as well as property and vehicle taxes were also introduced in 1986. Besides these reforms, significant changes were made to improve the effectiveness of the tax administration ('Impuestos Nacionales'). An important change in this regard was that taxes were from then on processed through an electronic system managed by the banking system (for more on contemporary Bolivian reforms on tax and other policies see Box 1). Following these reforms, tax revenue (% GDP) became close to 20% as from 1986 onwards (see Figure 5).[27] The early 1980s hyperinflation also fell to 14.6% by 1987 and further stabilized by reaching single digits in 1993.

[27] Since 1986, tax revenue has continued to rise in Bolivia and it currently constitutes about 40% of GDP

Figure 9: General government revenue & Tax revenue in Bolivia %GDP



Source: using data from IMF WEO

However, there were significant 'VAT gaps' observed, especially in the early years following the introduction of the tax system (see Figure 11 and 12 in section 4.2). The country has also undertaken various reforms meant to address these inefficiencies. As such the country offers an interesting case for how a typical developing country can maximize the tax revenue gains from its VAT system.

Box 1: History of Tax Reforms in Bolivia

After years of instability under military regime and repeated coups (see Table B1 in Annex), Bolivia moved into a democratic political system in 1982.[28] However, following severe macroeconomic ills that culminated in hyperinflation, the administration was forced to leave office in 1985. The regime that followed stabilized the economy and also introduced wide ranging reforms that took the country to liberalization. There were wide ranging reforms on international trade, the functioning of the financial market and other sectors of the economy (see Table B1 in Annex). The reforms also included important overhauls of the tax codes of the country, of which the introduction of VAT was one. As Wiggins et al. (2006) note, the fruits of the reforms were quickly visible.

Part of the immediate success of the Bolivian tax reform in 1986 lies in its simplicity. The country's tax system comprises of taxes that have broad tax bases, with few exemptions and deductions. This, conversely, facilitates the process of tax administration. The taxes following the reform were few in number and are also mainly consumption based, making their implementation easier. Further, there have only been minor changes since the original tax reform introduced VAT in 1986, except for some key reforms such as those of 1994 and 2003 (see Table A1 in Annex). The amendments which followed the reform also adhered to the overall principle of simplicity and generality (Munoz, 2016).

As Jenkins and Larrain (1991) note, the 1986 Bolivian tax reform was the most radical and effective of tax policy changes of its time. After the reform, the country was left with a uniform tariff rate and uniform VAT.

[28] The government which entered office in 1982 was a left-leaning government, as was the case in many Latin American countries of the era.

A set of taxes were also introduced to complement the VAT (see Table A1 in Annex). Furthermore, a few set of excise taxes were designed for specific consumption items. These consumption based taxes were also complemented by a low turnover tax, a presumptive income tax on corporations, a property tax, and an inheritance tax. By contrast, from the late 1970s to mid-1980s, the tax system of Bolivia had about 120 different types of taxes (Munoz, 2016). Even within the category of 'sales taxes', there were numerous different rates, which after the reform were converted into a single standard rate.

What made the 1986 tax reform (law 843) successful was the fact that it was more than a simple change in the tax policy of the country. The tax reform radically modified the Bolivian tax system by targeting both increases in revenue and also improving the tax administration system of the country (Genuzio, 2014). The tax reform introduced (in phases) major changes to the administration of the domestic taxes.[29] The statutory base of Bolivia's VAT is also one of the broadest in the world. A single VAT rate is levied on the sales of all goods and services. Few exceptions include financial sector transactions between businesses and final construction. Furthermore, exports are zero rated. In principle, there is no minimum size for businesses to introduce the VAT tax, as some other countries do. However, given the obvious administrative challenges in collecting VAT, it is not feasible to collect it from very small enterprises.[30] Therefore, some small businesses, and sectors such as agriculture, are largely exempt from VAT by supreme decree (Jenkins and Larrain, 1991).

The 1986 tax reform also benefited from the 1985 broad economic reform (Nueva Política Económica), which introduced various structural reforms that transformed the economy (Munoz, 2016). The reform established the legal framework for economic management based on market forces. The government also introduced complementary reforms that focused on enhancing the institutions of the country (Wiggins et al., 2006). Some of the key reforms that run up to mid-1990s included the privatization of state enterprises (see Annex B). This progressed through the process of 'capitalization' in which investors from the private sector were allowed to take up to 50% of stake while the other half was preserved to agents of the public realm, such as pension funds and workers. These reforms touched sectors such as telecommunication, transport, electricity, hydrocarbons, water, etc. For instance, the 1996 reform (Law 1731 in Table A1 in Annex) transferred the duties of YPFB (the state company responsible for oil and gas field development) into the hands of private companies. A process of decentralization was also started in 1995 which gave the then 314 municipalities of the country increased access to resources (tax and other revenue streams) and also the capacity to decide themselves on various local socio-economic issues.[31] This could be seen from the contents of Law 1606 of 1994, particularly the 'Impuesto municipal a las transferencias' (IMTIV) tax (see Table A1 and A2 in Annex).

Other reforms of the period included the introduction of a pay-as-you-go pension system that was converted to capital funds. The civil service of the country also saw reforms where, for instance, the 1990 SAFCO law was introduced to improve the financial administration of the country. Another reform (PSDC program of 1992) sought to staff government institutions with core professional staff. Further decrees and policies that would improve the judicial system, customs authorities and social programs of the country were set. The banking sector was also reformed to enhance the operational capacities of the Bolivian Central Bank and the commercial banking sector of the economy, especially the development of private banking

[29] As can be seen in Table A1, the 1986 reform introduced the Value added tax and a range of other tax groups. This major tax reform was also followed by a series of reforms that were intended to further boost government revenue. For instance, the February 1992 reform (Law 1314) made amendments to the value added tax system. The original tax rate (which was 10%) was modified by Law 1314 of 27 February 1992 to 13%. The reform also enhanced the VAT tax collection (specifically IVA and RC-IVA tax categories in Table A1 in Annex). It did so by setting a sort of a 'transition program' where VAT tax payers with tax debts in arrears got the possibility to cancel their debts with single payment (Genuzio, 2014). Further, the December 1994 tax reform (Law 1606) introduced Property tax on real estate, Municipal tax transfers, Excise duty on hydrocarbons (see table A1 in Annex). Other tax reforms also followed for extractive activities and mining (e.g. Law 1731 of November 1996 and Law 1777 of March 1997) and also the finance sector (Law 2646 of April 2004).

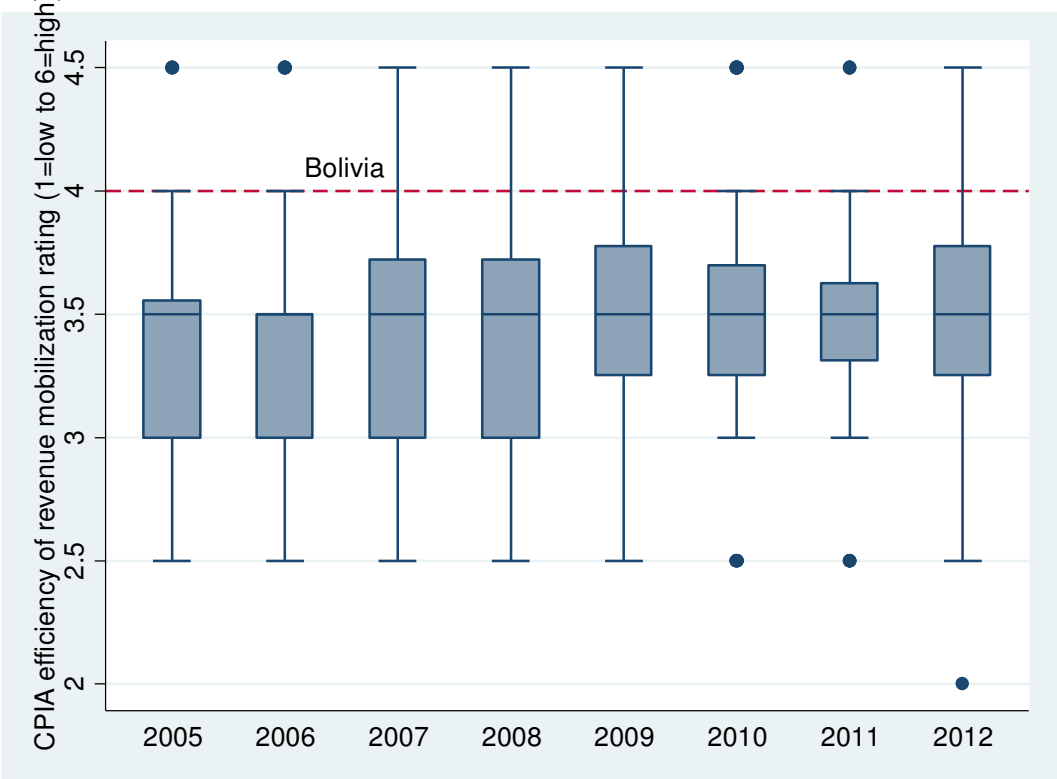
[30] Each VAT taxpayer is given a distinctive identification number (RUC) which is used for all tax payments to the national tax service and on all tax declarations and payments. The smaller VAT payers could make their transactions using any bank in the country. The largest VAT payers (which constitute a sizeable share of the overall VAT receipts) are, however, required to use the state banks.

[31] The current number of municipalities has grown to 327.

institutions (Kaufmann et al. 2003; World Bank, 2005; Wiggins et al., 2006). Such measures, among other benefits, help to improve the overall administrative capacity of public institutions - where the national tax administration is one. By also creating a conducive environment for growth and smooth functioning of economic activities, such reforms might indirectly lead to growing tax revenue streams.

Bolivia has been scoring well above average-country performance in the 'efficiency of revenue mobilization' rating of World Bank's Country Policy and Institutional Assessment (CPIA) index. In particular, since the launch of the cross-country comparator index in 2005, Bolivia has continuously scored 4 out of 6, placing it in the top quartile of developing countries (Figure 10).

Figure 10: Efficiency of Revenue Mobilization in Bolivia

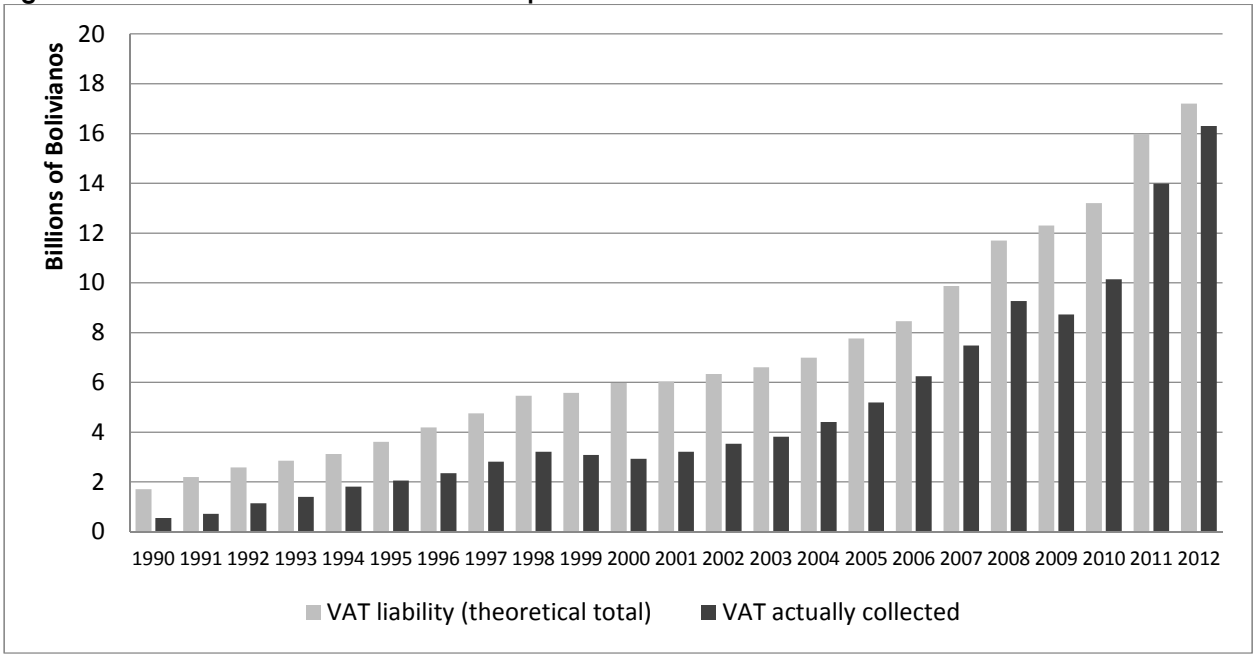


Source: using data from WB WDI (Country Policy and Institutional Assessment -CPIA data)
Note: The boxplots for each year show the distribution of CPIA score ratings for revenue mobilization efficiency. Given a country's score (e.g. 4 on the scale of 6 for Bolivia), we can see how it compares to other developing countries ranked by the CPIA index. As could be seen in the figure, Bolivia has been ranked either as one of the highest scorers (years 2005, 2006, 2010, 2011) or within the top quartile of countries (years 2007, 2008, 2009, 2012).

4.2 Understanding the dynamics of VAT gap in Bolivia

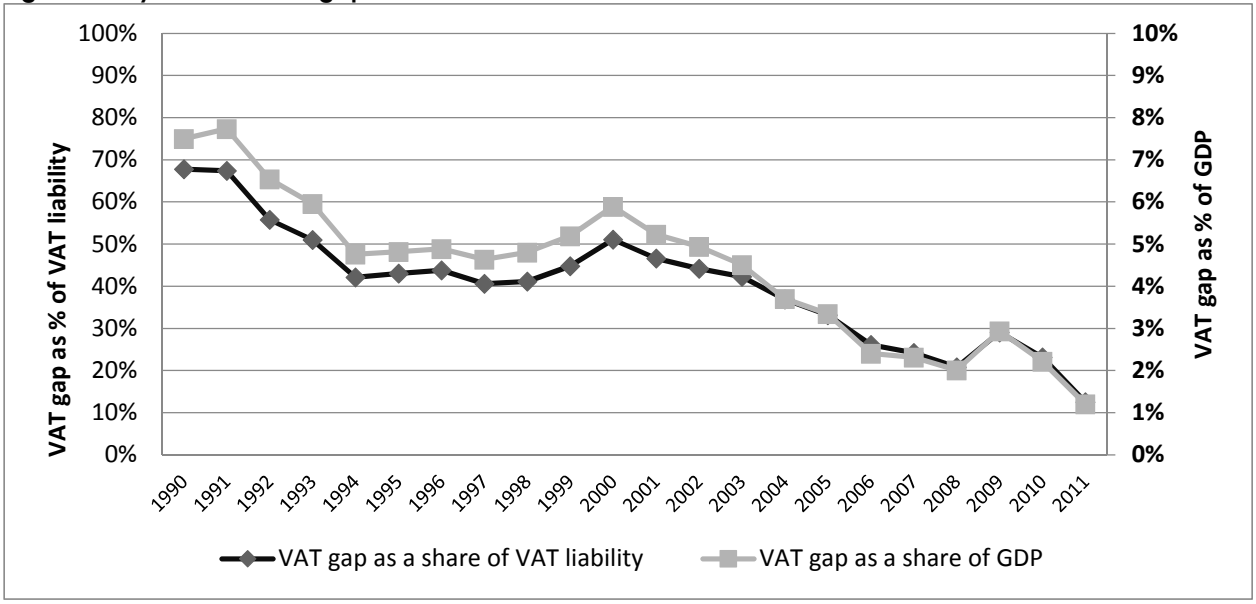
Following the introduction of VAT and successive tax-policy reforms, government revenue has been increasing in Bolivia. The reforms have led to improvements in both 'potential' VAT receipts and 'actual' VAT receipts (Figure 11). The country is already benefiting from its adoption of VAT (i.e. by boosting tax revenue) and has even more room for further benefits if it closes the remaining VAT gap.

Figure 11: Theoretical versus actual VAT receipt in Bolivia



Source: using data from SIN

Figure 12: Dynamics of Vat gap in Bolivia

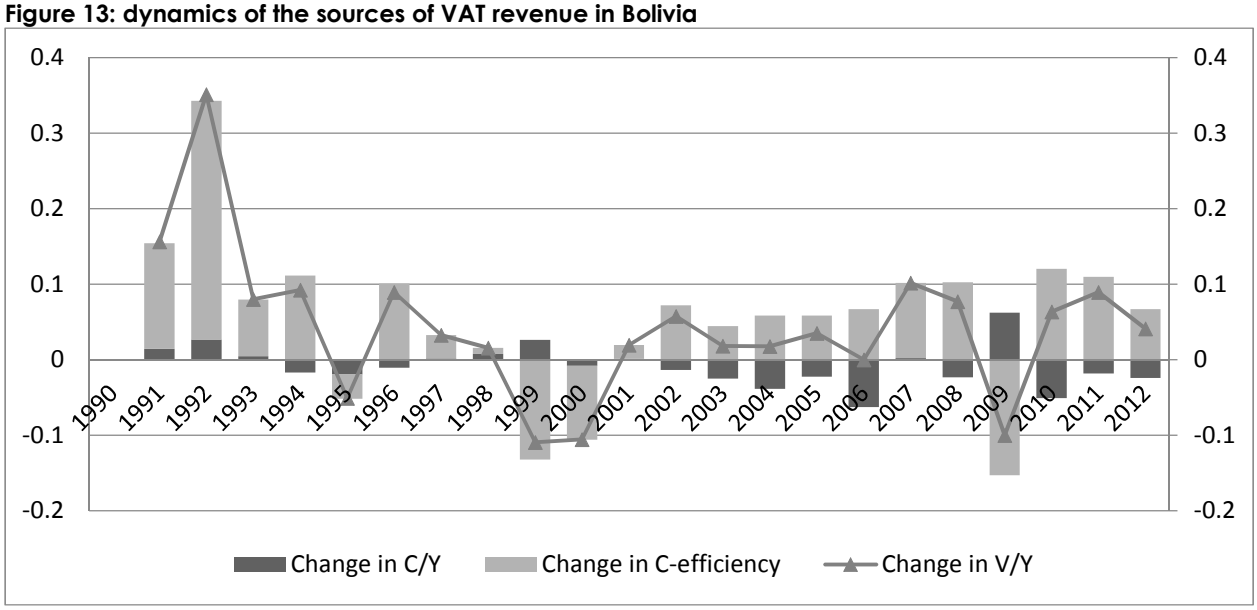


Source: using data from SIN

VAT gap in Bolivia has been continuously declining, both as share of potential VAT receipts (i.e. liability) and also as share of GDP. The lost/uncollected VAT receipts have been cut by more than 55% as a share of VAT liability within two decades. Further, in the period 1990-2012, VAT gap as share of GDP has also fallen

from about 7.5% to about 1.2%. This represents a massive revenue gain by Bolivia, where the country has closed a gap of over 6% of GDP in a span of two decades.

Figure 13: dynamics of the sources of VAT revenue in Bolivia



Source: using data from SIN

As can be observed from Figure 13, the initial years after the introduction of VAT, changes in c-efficiency (i.e. closing of VAT gap) used to be the primary driver of the rise in gross VAT revenue. In later years, however, changes in consumptions share of GDP (i.e. rising consumption expenditure, often linked to economic growth and rise in personal income) have become equally responsible in determining changes in VAT revenue. Therefore, Bolivia and other DGD partner developing countries could expect to make significant advances in VAT revenue earning both through expansion of their economy (thus growing consumption) and also by boosting their tax collection efficiency and closing their considerable VAT gaps. In the case of Bolivia, at least, the rise in tax collection efficiency (C-efficiency) have comparatively been the bigger driver of the changes in VAT revenue.[32]

Figure 2 shows the significant gains that Bolivia has been able to attain in c-efficiency and also the extent to which it has been able to close its VAT gaps. Specifically, we show to what extent Bolivia has been able to close its 'policy gap' and 'compliance gap' (see section 2 for the methodology behind these decompositions).[33] As we can see from the table, Bolivia has been able to considerably raise its c-efficiency from a level under 30% in 1990 to about 80% in 2012.[34] In the meantime, compliance gap has been closed from 60% to 9% in the period. Similarly, the policy gap has been winded down from 31% to 12% in the same period. The straightforward observation from the VAT gaps is that, Bolivia has made a bigger gain in reducing its compliance gap – as compared to policy gap. This was much needed since at the beginning of the period compliance gap was the bigger of the two gaps (i.e. 60% vs. 31% in 1990).

[32] we analyze the post 1990 period due to data restriction---would have been also interesting to include the yrears as from 1986

[33] For more on the theoretical foundations of these VAT gaps see Keen (2013).

[34] If Bolivia manages to push the C-efficiency – say- fully to 100%, what this means is that its VAT revenue would increase by 25% (i.e. $=\frac{(1-E_{it}{}^{C})}{E_{it}{}^{C}}$). Had the C-efficiency been 100%, Bolivia would have only needed a standard rate of 10.4% to gather the same level of VAT revenue as it does now, using the current rate of 13% with an 80% C-efficiency (i.e.= $\tau_{s_{it}}\ E_{it}{}^{C}$). This, however, assumes that consumption is unchanged and the standard VAT rate is applied to all consumption. For more on these VAT mechanics, see Keen (2013).

Table 2: Decomposition of VAT gap in Bolivia

Year	C-Efficiency (%)	Compliance gap (%)	Policy gap (%)	Policy gap, % (rate Differentiation) [35]	Policy gap, % (Exemptions)
1990	28	60	31	2	30
1991	32	59	23	2	22
1992	42	57	2	2	1
1993	45	53	5	2	3
1994	50	45	10	2	8
1995	48	45	13	2	11
1996	53	45	4	2	2
1997	55	39	10	2	9
1998	55	38	11	2	10
1999	48	44	14	2	13
2000	43	50	14	2	13
2001	44	46	18	2	17
2002	47	43	18	2	16
2003	49	42	16	2	14
2004	52	38	15	2	14
2005	55	33	18	2	16
2006	59	28	18	2	16
2007	65	27	11	2	9
2008	71	22	8	2	7
2009	60	31	13	2	11
2010	68	25	10	2	8
2011	75	14	13	2	11
2012	80	9	12	2	10

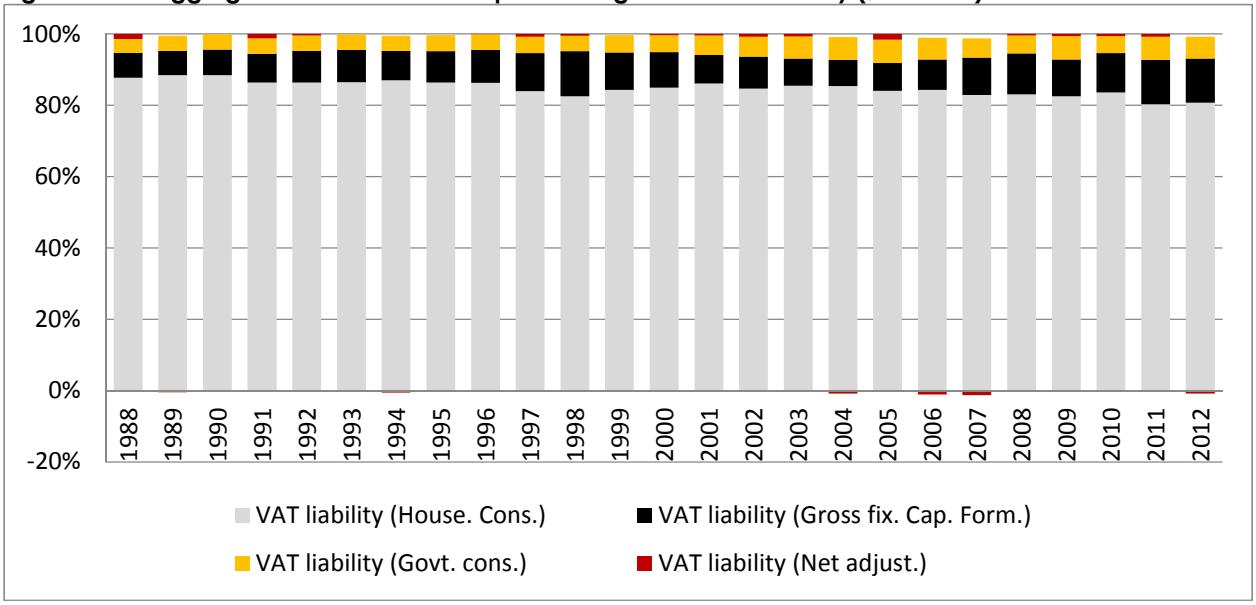
Source: using data from SIN

4.2.1 Disaggregated VAT analysis

To get a clearer and disaggregated view of the VAT liability in the country, figures 14 and 15 give the VAT liabilities by dissecting the sources into four sub sections, namely: household consumption, government consumption, gross fixed capital formation and net adjustments. As we can see from the following figure, household consumption represents the largest potential source of VAT receipts. Furthermore, we also notice that the sectoral share of potential VAT revenues has not changed much over the years. This is a possible indication that the structure of the Bolivian economy has not changed much over the years under consideration.

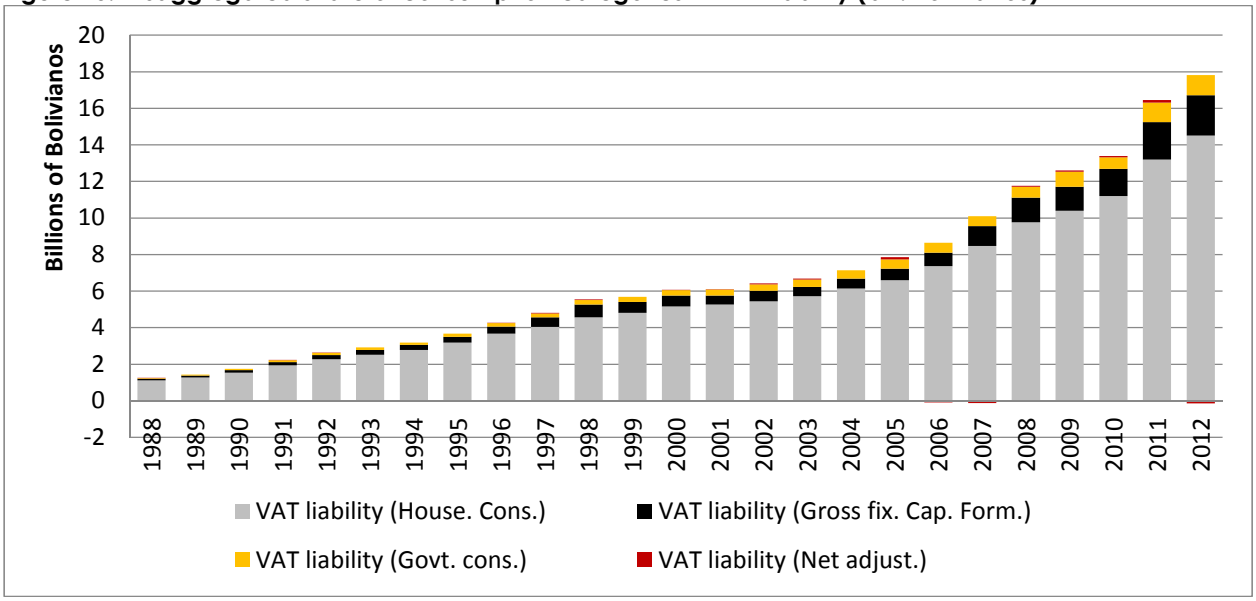
[35] For this simulation we use the gap between nominal VAT rate (13%) vs the effective VAT rate (14.94%). For more on VAT rates in Bolivia see Ernst and Young (2015).

Figure 14: Disaggregated share of consumption categories in VAT liability (% of total)



Source: using data from SIN

Figure 15: Disaggregated share of consumption categories in VAT liability (bill. Bolivianos)



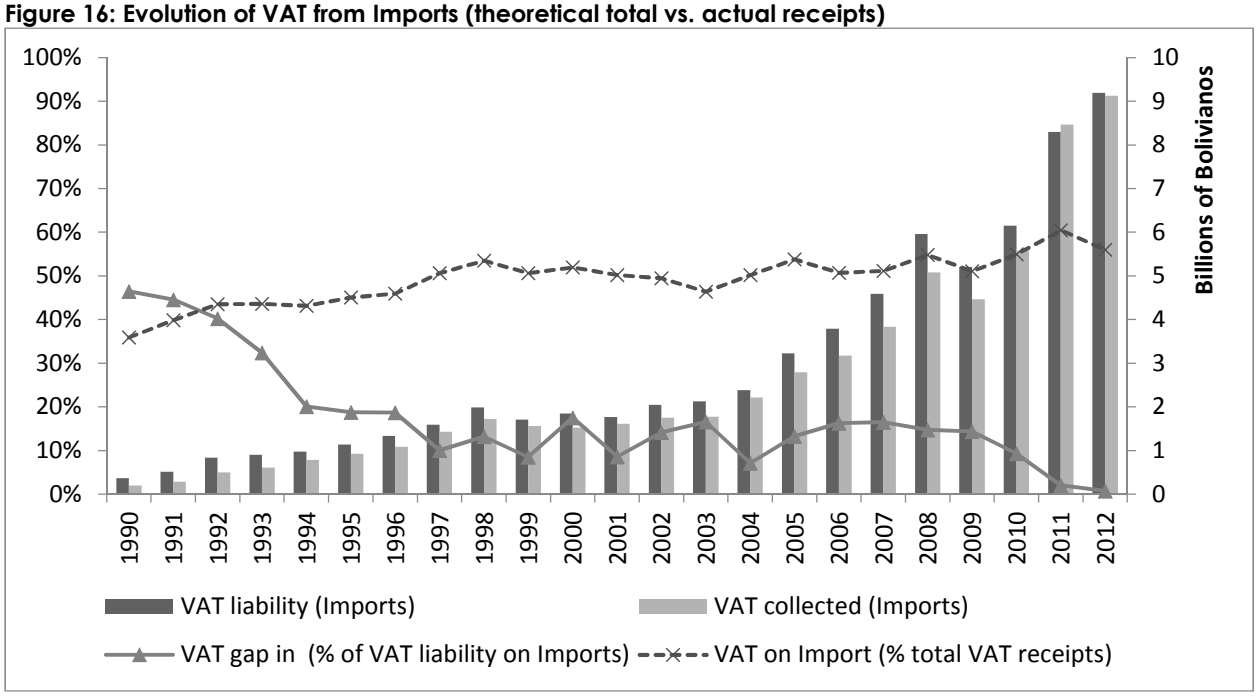
Source: using data from SIN

4.2.2 Sectoral illustration (Imports)

As a further illustrations, we will show how the VAT dynamics on imports has evolved in Bolivia in recent years. The following figure shows that the VAT liability (i.e. potential VAT revenue) on imports has rapidly grown over the recent years. This very much mirrors the trend we saw for overall VAT liability for the whole economy. However, what is even more interesting is that the VAT gap on imports have almost disappeared in recent years. Bolivia appears to have done a remarkable job with respect to closing the VAT gap on imports. Furthermore, given the fact that the VAT revenue from imports constitutes a big part of the overall VAT

revenue (more than 50% in recent years), this has resulted in a robust upward surge in VAT receipts (see Figure 11 above for the historical gross VAT receipts).

Figure 16: Evolution of VAT from Imports (theoretical total vs. actual receipts)



Source: using data from SIN

We could also reveal the overall decline in VAT gap in Bolivia by witnessing the trend in various specific sectors. For instance, the VAT gap in the 'Communications' sector has declined from over 66% in 1988 to about 10% in 2011. Similarly, the VAT gap in 'Textiles, Clothing and Leather Goods' sector has declined from over 78% in 1988 to around 15% in 2012. Furthermore, the VAT gap in the 'Electricity, Gas and Water' sector has declined from almost 52% in 1990 to about 16% in 2010. The VAT gap in 'Restaurants and Hotels' businesses has also significantly narrowed from about 72.5% in 1988 to a mere 13% by 2012.

The sectors where bigger VAT gaps are still witnessed are those sectors that involve a lot of informality. These are largely activities of the rural economy (e.g. sectors such as 'Non-Industrial Agricultural Products' and 'Livestock Products') and/or sectors with considerable legal exemptions (e.g. sectors such as 'Financial services').[36] In these sectors, the VAT gap is often in excess of 80%. Further reductions of VAT gaps are possible in these sectors. However, any policy change (i.e. exemption waiver) has to carefully compare and balance the potential revenue gains with the costs, be it in the form of welfare losses to consumers protected by current policy schemes (i.e. often the poor sections of the society) or enforcement costs to the tax administration.[37]

[36] Some of the exemptions for financial services include: Life insurance quotas (i.e. monthly payments to life insurance contracts); capital gains from sales or valuation processes determined by the 'Financial Supervisory Authority of Bolivia' (Autoridad de Supervisión del Sistema Financiero, or ASFI) for securities registered on the Bolivian Stock Exchange; transfers of goods or assets subject to the securitization process (titularización) administered by the securitization association; sales or transfers of portfolios, i.e. financial intermediation, insurance and pension (Ernst and Young, 2015).

[37] In the informal sector dominated by small transactions, enforcing VAT might itself be costly. Yet, relative to other taxes, perhaps VAT is the easier one to enforce in informal sectors - and is even argued to help the process of 'formalization' if properly implemented (Keen, 2008; Boadway and Sato, 2009).

5 | Concluding remarks and policy recommendations

Data from 18 DGD-partner countries[38] (past and present) over the 1990-2012 period show that, although the performance of VAT has inproved in recent years, many of these countries can close their resource gap by implementing reforms that improve the efficiency of their VAT system. We present an in-depth analysis on Bolivia to illustrate how such reforms could be designed.

We are able to decompose the Bolivian VAT gap into several sources and find that the compliance gap (i.e. tax evasion) has been reduced from 60% to 9%. Similarly, the policy gap (i.e. tax gaps due to government policy loopholes) has been winded down from 31% to 12% in the same time period. Furthermore, Bolivia has made a bigger gain in reducing its compliance gap – as compared to policy gap. This was much needed since at the beginning, the compliance gap was the bigger of the two gaps (i.e. 60% vs. 31% in 1990).

To get a clearer and disaggregated view of the VAT liability in Bolivia, we dissect VAT liabilities in to four consumer groups (i.e. consumption groups where VAT is levied), namely: household consumption; government consumption; gross fixed capital formation; and net adjustments. We find that household consumption represents the largest potential source of VAT receipts (around 80%) although the shares of gross fixed capital formation and government consumption have increased a bit in recent periods.

As a further sectoral illustration for the Bolivian economy, we show how the VAT dynamics on imports have evolved in recent years. VAT liability (i.e. potential VAT revenue) on imports has rapidly grown over the years. This very much mirrors the trends for overall VAT liability for the whole economy. However, what is even more interesting is that, the VAT gap on imports have almost disappeared in recent years. Bolivia appears to have done a notable job with respect to closing the VAT gap on imports. Furthermore, given the fact that the VAT revenue from imports constitutes a big part of the overall VAT revenue (more than 50% in recent years), this has resulted in a robust upward surge in VAT receipts.

This work shows that a detailed case study of the VAT gap is important in order to understand the causes and consequences of this particular tax instrument. In the case of Bolivia, we learn how the introduction of the VAT has been an important component of tax revenue streams. The reform also necessitated the improvement in the capacity of the country's tax administration. However, tax reforms are often plagued by protests from the private sector and/or political opposition. In the case of Bolivia these constraints were alleviated by at least two factors. First, the damage caused by the hyperinflation of the early 1980s on the economy convinced private agents that increasing government revenue was a necessary step. Second, the prevailing political system helped to secure the necessary support for tax policy reform.

This analysis of identifying disaggregated VAT gaps and inefficiencies, i.e. identification of VAT gaps in specific economic sectors and consumption groups, could easily be replicated to other DGD partner countries if the necessary data (such as specific commodity VAT rates, VAT exemptions, input-output tables[39] etc.) is available to the BeFinD research team.[40] Examination of VAT gap in other DGD partners countries where we see large gaps (e.g. Niger, Uganda, D.R. Congo, Mali, etc.) could also be potentially interesting. As discussed at a joint meeting with IMF representatives, BeFinD and the DGD in Brussels, this kind of analysis can be part of the capacity building (and area of strong collaboration) among DGD and its partner countries.[41] Such a

[38] The list of DGD partner countries has been changing overtime, which follows changes in developmental and diplomatic priorities of Belgium and also the economic trends of its partner countries. For instance, some old partner countries such as South Africa, Vietnam, Peru, and Ecuador have become relatively robust middle income countries in recent years. On the other hand, the needs for development assistance have become relatively more important in some countries such as D.R. Congo and Burundi. The more recent list of DGD partner countries can be found here: http://diplomatie.belgium.be/en/policy/development_cooperation/where_we_work/partner_countries

[39] National input-output tables enable us to track the decomposition of VAT at every level of production and disaggregated sectors of the economy. The results of this would enable (concerned) policy makers and tax practitioners to observe where VAT is more inefficient and has larger gaps. This, in turn, allows them to take a sector focused policy measures which will close specific gaps.

[40] This would, however, require a close collaboration with the revenue ministries of partner countries. For instance, we have been trying to get the data for Benin but they are not complete.

[41] This meeting between IMF representatives, BeFinD researchers and the DGD took place in Brussels on January 14, 2016.

framework of bilateral cooperation can help to secure the necessary data and convince all parties about the advantage of this kind of analysis.

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Annexes

Table A1 : Tax reforms in Bolivia

Taxes[42]	Code	Law 843 (20-May-1986)	Law 1141 (23-Feb-1990)	Law 1314 (27-Feb-1992)	Law 1606 (22-Dec-1994)	Law 1731 (25-Nov-1996)	Law 1777 (17-March-1997)	Law 2646 (1-April-2004)
Value-added tax (Impuesto al valor agregado)	**IVA**	**X**						
value added supplementary scheme (Régimen complementario al valor agregado)	RC-IVA	X						
Alleged tax on corporate income (Impuesto a la renta presunta de las empresas)	IRPE	X						
Tax on imputed income property owners (Impuesto a la renta presunta de propietarios de bienes)	IRPPB	X						
outside beneficiaries (Beneficiarios exterior)	BE	X						
Excise duty to the tax regularization (Impuesto especial a la regularización impositiva)	IERI	X						
Transaction tax (Impuesto a las transacciones)	IT	X						
Excise tax (Impuesto a los consumos específicos)	ICE	X						
Death tax and free transfer of goods (Impuesto a las sucesiones y a las trasmisiones gratuitas de bienes)	ISTGB	X						
Tax air trips abroad (Impuesto a las salidas aéreas al exterior)	ISE		X					
Amendments on value added supplementary scheme (Régimen complementario al valor agregado) Transaction tax (Impuesto a las transacciones)	RC-IVA and IT			X				
Property tax on real estate (Impuesto a la propiedad de bienes inmuebles)	IPBI				X			
Property tax of motor vehicles (Impuesto a la propiedad de vehículos automotores)	IPVA				X			
Municipal tax transfers on property and motor vehicles (Impuesto municipal a las transferencias de inmuebles y vehículos automotores)	IMTIV				X			
Excise duty on hydrocarbons and its derivatives (Impuesto especial a los hidrocarburos y sus derivados)	IEHD				X			
Profit tax (Impuesto a las utilidades)	IUE				X			
IUE additional charges to extractive activities (Alícuota adicional al IUE de actividades extractivas)	AA- IUE					X		
Complementary mining tax (Impuesto complementario a la minería)	ICM						X	
Tax on financial transactions (Impuesto a las transacciones financieras)	ITF							X

Source: Genuzio (2014)

[42] The description of these taxes is given in Table A2 in Annex.

Table A2 : Description of the taxes incorporated in the tax reforms

Taxes and duties	Official tax name (in Spanish)	Applicable to	Taxable transactions	Tax base	Rate	Modification of tax law	Other comments
Value Added Tax	Impuesto al valor agregado	Natural and legal persons, public and private	The transfer of ownership of the property	Net sales	0.13	The original tax rate was 10% and the modified by Law 1314 of 27 February 1992	Except the collection of financial utilities and insurance.
supplementary scheme to VAT	Régimen complementario al IVA	Individuals and undivided estates.	Income from investment of capital, labor or the joint application of both factors	The total amount of earned income, considering the exceptions of contributions to social security	0.13		Introduced in 1993
Transaction tax	Impuesto a las transacciones	Natural and legal, public and private persons. Including Proprietorships	economic transactions, except work as employees, performance in public office and exports	gross income earned by the exercise of a taxable activity	0.03	Originally the rate was 1% and was amended twice, the last in 1994	The amount payable for this tax may be deducted from the amount actually paid in the previous year IU
Excise tax	Impuesto a los consumos específicos	Manufacturers and importers of products subject	The sale of products taxed with this tax	The net sale price recorded in a tax note	Variable depending on the product, according to specific lists	The goods subject to: Alcohol, Tabaco and motor vehicles	The goods subject to: Alcohol, Tabaco,
Municipal tax transfers	Impuesto municipal a las transferencias	natural or juridical person whose name is recorded good subject of transfer	any transfers of property and vehicles	The value actually paid for the good to be transferred or which had been determined for this purpose	0.03		

Excise duty to tax regularization	Impuesto especial a la regularización impositiva					It is not in force	It is not in force
Tax on corporate profits	Impuesto sobre las utilidades de las empresas	Public and private companies. Except foundations and NGOs	Corporate profits, resulting from their financial statements	Profit generated by companies, resulting from their financial statements	0.25	Replaces the IRPE	The actual payment of this tax is considered deductible payment account IT
Tax on property owners (Impuesto a los propietarios de bienes)	Impuesto a los propietarios de bienes	natural and legal persons owning property	Estate	The tax assessment established in each municipal jurisdiction	Variable, from 0.35% to 1.5%, according to the valuation of the good	Replaces IRPPB	Replaces IRPPB
		natural or legal persons, owners of any motor vehicle	Vehicles	Vehicle values, in-customs, for models last year and the depreciating value for vehicles of previous models	Variable, from 1.5% to 5% according to the valuation of the vehicle, plus a fixed rate established		
Succession and tax-free transfer of goods	Impuesto a la Sucesión y a la Transmisión gratuita de bienes	natural or legal persons, beneficiaries of the transfer of ownership	Hereditary succession and legal acts by which ownership of property is transferred free	Appraised value of the property	1% Parent, child and spouse 10% Brothers and their descendants 20% Other		
Tax on air trips abroad	Impuesto a las salidas aéreas al exterior	natural persons residing in Bolivia, except diplomats	Boarding the aircraft	Lump sum tax	lump sum tax Bs. 169		

Excise duty on hydrocarbons and its derivatives	Impuesto especial a los hidrocarburos y sus derivados	natural or legal persons who sell in the domestic market hydrocarbons or their derivatives	The fact is perfected in the first stage of marketing or refinery output and imports if the time of departure customs	Lump sum tax	Bs. 3.5 per liter or equivalent unit of measure	ICE tax actually paid for the product included in the mixture with hydrocarbons and derivatives may be credited as payment on account of this tax	ICE tax actually paid for the product included in the mixture with hydrocarbons and derivatives may be credited as payment on account of this tax
Complementary mining tax	Impuesto complementario a la minería	natural or legal persons engaged in mining activities	Sale or export of minerals	gross sales value, calculated based on the share price of taxed mineral	It varies depending on the trading price and the type of mineral	Amended by Law 3787. BMI replaces MRI	The amount actually paid by concept of ICM will be creditable against the tax IUE
Tax on financial transactions	Impuesto a las transacciones financieras	natural persons or legal holders of current accounts and savings and financial system users	financial operations through the banking system	Gross amount of taxable transaction	0.0025	It was created by Law 2646 of 1 April 2004	It was created by Law 2646 of 1 April 2004

Source: Genuzio (2014)

Annex B: Summary of political regimes and economic policies

Table B1 : Political regimes of Bolivia and their major economic policies (pre and post VAT era)

Period	Political Phase	President	Ideology	Modality of ascend to power	Major Economic Measures	Average fiscal deficit %	Average inflation rate %	Average growth rate %
1964-65	Military	Rene Barrientos Ortuno	Right wing	Coup	Large subsidies credits, large investment in public sector, foreign direct investment in oil and mining.	-	6.5 ↓	6.9 ↑
1965-66		Alfredo Ovando Candia Military	Right wing	Designated by the army	Continuation of policies	-	4.9 ↓	7.0 ↑
1966-69		Rene Barrientos Ortuno	Right wing	Election	Continuation of policies	-	6.2 ↑	6.0 ↑
1969		Luis Adolfo Siles Salinas	Center-right	VP elected	Continuation of policies	-	2.2 ↓	4.7 ↓
1969-70		Alfredo Ovando Candia	Nationalism	Coup	Nationalization of private oil company.	-	3.0 ↑	5.2 ↑
1970-71		Juan Jose Torres G.	Populist	Coup	Nationalization of some private firms.	1.4	3.7 ↑	4.9 ↓
1971-78		Hugo Banzer Suarez	Right wing	Coup	Credit subsidies, boom in exports of gas and tin, investment incentives for private firms, coca industry begins and expands rapidly, large subsidies to private sector.	1.8 ↑	18.8 ↑	5.4 ↑
1978		Juan Pereda Asbun	Right wing	Coup		2.7 ↑	10.4 ↓	3.3 ↓
1978-79		David Padilla Arancibia	Right wing	Coup		3.8 ↑	15.0 ↑	1.8 ↓

1979	Transition period. (Short military and congress appointed governments)	Walter Guevara Arze	Center	Designated by Congress		4.9 ↑	19.7 ↑	1.8
1979		Alberto Natusch Busch	Right wing	Coup		4.9	19.7	1.8
1979-80		Lidia Gueiler Tejada	Center	Designated by Congress	Stabilization plan attempted but failed because of military overthrow.		33.4 ↑	-0.55↓
1980-81		Luis Garcia Meza Tejada	Right wing	Coup	Major increase in coca industry and corruption.	6.0 ↑	39.6 ↑	0.3 ↑
1981		Military Junta	Right wing	Designated by the army		5.6 ↓	32.1	0.3
1981-82		Celso Torrelio Villa	Right wing	Designated by the army		5.6	77.8 ↑	2.8 ↑
1982		Guido Vildoso Calderon	Right wing	Designated by the army		22.3 ↑	123.5 ↑	2.8
1982-85	**Democratic phase**	**Hernan Siles Zuazo**	**Left-wing**	**Election**	**Hyperinflation, minimum wage increases, black markets**	**23.4 ↑**	**4471.7 ↑**	**-3.0 ↓**
1985-89		**Victor Paz Estenssoro**	**Center-right**	**Election**	**Stabilization package, price liberalization, trade liberalization, reforms to smooth market mechanism, end of subsidies.** **+ Introduction of VAT and other major tax reforms**	**7.7 ↓**	**75.0 ↓↓**	**1.8 ↑**
1989-93		Jaime Paz Zamora	Center-right	Election	Privatization of small SOE's	4.3 ↓	14.7 ↓	3.9 ↑
1993-97		Gonzalo Sánchez de Lozada	Center-right	Election	Privatization of large SOE's. Establishment of regulatory framework Creation of private pension funds Banking Law Central Bank Law	3.2 ↓	8.8 ↓	4.4 ↑

1997-2001		Hugo Banzer Suarez	Center-right	Election	Judicial Reform National Dialogue Anti-drug program	3.7 ↑	5.2 ↑	2.4 ↓
2001-2002		Jorge Quiroga	Center-right	VicePresident elected. Assumed Presidency after Banzer's resignation due to illness.	Proposed program for year 2001/2002: Implement Poverty Strategy Implement anticorruption program Implement Emergency Program for economic recovery	3.7	3.7	2.5

Source: Kaufman et al. (2003)