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# Metrics to improve universal-service fund disbursements

Rohan Samarajiva and Gayani Hurulle

## Abstract

**Purpose** – Many governments wishing to provide telecommunication services to those who are unconnected have chosen the Universal Service Fund (USF) as the principal policy instrument. However, there is evidence that monies directly or indirectly collected from users of telecommunication services are lying unspent in these funds. The purpose of this paper is to propose metrics for measuring the disbursement efficacy of funds across time and across countries as an essential element of improving the performance of the universal service funds.

**Design/methodology/approach** – This paper proposes two metrics, the total disbursement rate (TDR) and the year-on-year disbursement rate (YDR), which can be used to assess the disbursement efficacy of universal service programs. It illustrates the value of the metrics by applying them to the USFs of India, Malaysia and Pakistan.

**Findings** – A move to push out funds has been observed in India in recent years. Pakistan had not reached the same momentum up to mid-2014. An improvement in Malaysia's disbursement efficacy was observed until 2013, with nearly all of the funds collected in the previous year being disbursed. A significant proportion of the funds collected are lying unspent in the three USFs, nevertheless.

**Originality/value** – The proposed metrics are robust, objective and parsimonious indicators that allow comparison over time and across countries. They will enable productive, evidence-based conversations that will hold fund administrators accountable and will inform the design and implementation of more effective policy mechanisms.

**Keywords** Regulation, Economic performance, Efficiency, Indicators, Telecommunications reforms, Universal service

**Paper type** Research paper

## 1. Introduction

As is the case in all infrastructure industries, the telecommunications industry is affected by the challenge of serving all persons desirous of service. The normal incentives in infrastructure industries cause the suppliers, who tend to have varying degrees of market power, to prioritize the high-revenue, low-cost market segments. Governments, because of the nature of infrastructure services, tend to want suppliers to provide services sooner to a larger area or to a larger population than the suppliers may consider commercially viable. When the industry is monopolistic, service extension will occur because of government or extra-market pressure. With greater competition, there will be incentives for market forces to be more effective, but even then, some areas and populations perceived as likely to yield inadequate revenues in relation to costs may remain unserved.

Prior to the present wave of reforms, telecom services in most countries were provided by government-owned monopolies. These monopoly operators were regularly ordered to serve rural areas and regularly failed to comply with the possible exceptions of Australia and Finland. In the case of private monopolies, as in the USA, parts of Canada and the Philippines, the most common mechanism was a requirement in the operator license or

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concession contract that defined network deployment requirements, also known as universal service obligations (USOs). Other approaches included special franchises for rural areas and subsidies for rural areas.

The *ICT Regulation Toolkit* refers to universal access as a condition wherein everyone can access the service anywhere, at a public place; thus, it is also called public, community or shared access. Universal service, on the other hand, describes the situation wherein every individual or household can have service, using it privately, either at home or increasingly through wireless devices carried on the person ([InfoDev & International Telecommunications Union, n.d.](#)).

By around 2000, expert consensus converged on the stance that universal service/access funds were more effective than USOs for achieving the public-policy objective of extending service to rural areas, especially under conditions of workable competition ([Clark, 1940](#)). Indeed, the Regulation Reference Paper that was part of the Protocol Four of the General Agreement on Trade in Services (GATS) included specific provisions related to universal service that amounted to a legal obligation on the part of committing governments:

Any Member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the Member. ([World Trade Organization, 1996](#))

Debates around telecom-sector reforms also contributed to changes in the approach to extending coverage. Opponents of reform, primarily the managers and employees of state monopolies, made a two-fold argument. They argued that the new, private entrants would engage in “cream skimming,” or just serving the lucrative urban areas and/or commercial enterprises ([Madden, 2010](#)). They also attributed all the shortcomings of the now-threatened government-owned incumbent operator to its universal-service obligations, conveniently keeping silent about the poor performance in actually fulfilling those obligations.

In countries such as Malaysia and South Africa, universal-service obligations were imposed on the privatized incumbents ([Gillwald, 2005](#)). But in subsequent reforms, the policy shifted to the inclusion of provisions for universal service levies to be charged usually as a percentage of adjusted gross revenues (AGR). The funds so collected were to be expended on expanding universal service and access. This article seeks to assess the efficacy of this second generation of universal-service policies.

Universal service programs may be examined in terms of inputs, outputs and outcomes. The money going in, from whatever source, is inputs. Outputs are the activities for which the funds are applied. Outcomes of an effective universal-service policy would be the number of people connected as a direct result of universal-service subsidy programs, who would not otherwise be connected through market mechanisms. Outputs must precede the production of outcomes. The outputs of universal-service programs may be seen in terms of necessary and sufficient conditions. The necessary condition is that the money, once collected, must be disbursed from the fund. The sufficient condition is that the disbursed funds must be spent as intended by the enabling legislation or regulations. Unless the necessary condition of money being disbursed is satisfied, the sufficient condition of the disbursed funds being spent as intended by the enabling legislation or regulations cannot be examined. Without outputs, it is not possible to assess outcomes.

The outcome of an effective universal-service policy would be the number of people connected as a direct result of universal-service subsidy programs, who would not otherwise be connected through market mechanisms. An example would be the use of payphones that were provided to rural areas as a result of the Chilean universal-service auctions by inhabitants of the rural areas ([Serra, 2000](#)).

Additional taxes imposed on a particular good or service reduce demand (Musgrave and Musgrave, 1989). Thus, levies or taxes that are directly charged to end users or the service suppliers depress demand. In a market with adequate levels of competition, reduction of such levies is likely to reduce prices and increase demand. One defense of these kinds of levies is that they are similar to fuel taxes that help maintain highways.

In the case of bundled road taxes, the beneficiaries are the people who pay for the fuel. This is not the case with universal-service taxes in the telecom sector, except in the indirect and partial sense of the payees benefiting from the increased calling opportunities afforded by the addition of new customers to the network. But, in any case, there can be no benefit when fuel taxes are not used for road maintenance but are kept by government, which is the case with telecom taxes.

Inputs and the necessary condition for outputs can be measured in objective, quantitative terms. Being dependent on country-specific legislation and policies, the necessary condition for outputs and outcomes cannot be assessed in purely quantitative terms that can be compared across countries. They are also open to contestation.

Robust, objective and parsimonious indicators that allow comparison over time and across countries will assist stakeholders and policymakers design and implement effective policy mechanisms. The use of standardized, comparable indicators for USFs may allow not only administrators to ascertain their performance but also stakeholders to push them to take remedial action if the metrics show the status quo to be unsatisfactory.

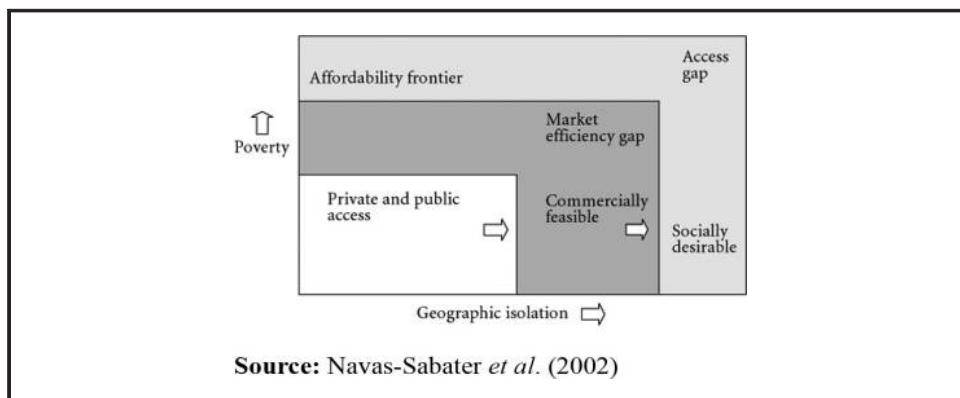
This article proposes a set of metrics that can be used to assess the efficacy of universal service instruments, with emphasis on the necessary condition. It illustrates the value of the metrics by applying them to the Universal Service Funds (USFs) of India, Malaysia and Pakistan.

## 2. Literature review

Navas-Sabater *et al.* (2002) presented a heuristic for thinking about the relationship between sector reforms and subsidies, showing the need to differentiate between the market efficiency gap and the access gap in the design of universal-service programs (Figure 1).

The market-efficiency gap is best addressed by market reforms. The access gap refers to people and places that remain beyond the limits of the market because of inadequate income levels or its skewed distribution. Bridging the access gap requires subsidies to encourage service providers to enter these areas (De Silva, 2008). Others, such as Crandall *et al.* (2004), are less optimistic, stating that subsidies should not generally be used to promote universal service, and are likely to hurt the average consumer. The value of the

**Figure 1** Conceptual access gap framework



heuristic proposed by Navas-Sabater *et al.* is diminished by its lack of a rule defining where the market-efficiency gap ends and the access gap begins. It does not preclude subsidies being implemented as solutions for problems better addressed by market mechanisms.

The World Bank was a major proponent and funder of USFs. Thus, it was highly significant when the Independent Evaluation Group of the World Bank, after reviewing 10 years of bank activities in the information and communication technology (ICT) sector stated, “targeted efforts to increase access beyond what was commercially viable have been largely unsuccessful. Support to universal access programs was largely superseded by the rollout of phone services by the private sector [...]” ([Independent Evaluation Group, 2011](#)). In other words, market liberalization connected people. Subsidy programs did not.

The funding sources for USFs, for both telecommunications and others, such as the postal service, have been well documented ([Cremer \*et al.\*, 2001](#); [Borsenberger \*et al.\*, 2010](#)). Despite many talking about how the preferable source of funds is the central budget as seen in Chile ([Wellenius, 2000](#)), most funds rely on levies collected through operators. The contradiction of trying to encourage the greatest use of telecom services (the stated objective of universal service) and imposing additional service-specific taxes on the same services did not attract much attention, with a few exceptions such as [Crandall \*et al.\* \(2004\)](#) and [Samarajiva \(2010\)](#).

Efficiency is given prominence in writing on the universal policy schemes in the USA. An example is the 2008 proposal to enact a Universal Service Reform Accountability and Efficiency Act of 2000 was intended to reform the collection and distribution of universal service support, which did not make it out of committee ([Congressional Research Service, 2011](#)). The literature on the US universal service programs focuses on inefficiencies, in the form of high administrative costs and misuse of funds, rather than on problems of disbursing money. The E-rate program, signed into law in the USA in the 1990s, sought to help schools and libraries gain access to telecommunications services. It has, however, faced some allegations of fraud and waste ([Meer, 2006](#)). It is noteworthy that such studies focus on the efficiency of individual projects, rather than on the utilization of all the funds in the USF.

From a more global perspective, the [International Telecommunications Union \(2013\)](#) refers to large amounts of undistributed funds, attributing this, in many instances, to the absence of access-gap evaluations and meaningful demographic surveys. A study by [Ladcomm Corporation \(2013\)](#) for GSMA, focused on disbursements, documenting the gap between the contributions gathered and the funds actually disbursed. Over US\$1.1bn was left to be disbursed in the 64 countries studied.

There is a growing body of evidence showing that metrics can help drive governments drive reform processes. For example, the Sri Lankan government set up eight task forces based on the ten pillars of the World Bank’s Doing Business Index, with the aim of moving up 40 positions in the index within three years ([Razak, 2018](#)). This has been explored in the case of USFs in [Goldstein \(2009\)](#), who used data on unused funds published by the Universal Service Administrative Company in their quarterly reports, to measure the percentage of committed funds disbursed. The findings indicate that although the proportion of disbursed funds fell at first, the amount of undisbursed funding in expired grant accounts declined when concerted efforts were made to address the problem ([Goldstein, 2009](#)).

This paper proposes two metrics to allow for the disbursement of funds to be measured: the first is the total disbursement rate (TDR). The second is a year-on-year disbursement rate (YDR). Poor performance as documented by these indicators may cause USF administrators to step up the disbursement of the funds if projects that suit the objectives of the relevant USFs have been formulated, or plan to step down the collection of funds if suitable projects do not exist.

### 3. Methodology

#### 3.1 Development of metrics

The first step is that of developing an easy-to-understand indicator that will permit the disbursement rate to be compared across time and across countries. This combines the two objective measures of inflows of funds (input) and outflows of subsidies (the necessary condition of output) over defined periods.

Two disbursement rates are proposed: the TDR and the YDR:

$$\text{Total disbursement rate}_t = (\text{disbursement of funds}_t / \text{funds accumulated in USF}_{t-1}) * 100$$

This measures the rate at which funds have been spent from the USF, relative to the funds accumulated in the fund at the beginning of the relevant period, which is set at a year. It is the rate of outflow of funds in a given year, relative to the previous year's year-end balance. The flow of funds into the USF in the given year is not taken into consideration in the calculation to accommodate procedural delays such as those in India, where the money first goes into the consolidated fund before being transferred to the USF. The proposed TDR permits a reasonable time for the fund administrators to process the inflows.

The YDR is even more forgiving:

$$\text{Year – on – year disbursement rate}_t = (\text{disbursement of funds}_t / \text{inflow of funds}_{t-1}) * 100$$

The YDR is the rate of outflow of funds in a given year relative to the inflow in the immediately preceding year. Funds that have accumulated in the USF over time are excluded from consideration. The YDR describes the efficacy of the agency in disbursing the most recently collected funds. Accumulated balances may not have been caused by those currently administering the funds, or been affected by actions outside their control, such as difficulties in obtaining funds kept with the Finance Ministry. In instances where significant accumulated balances exist, agencies should strive to achieve YDRs higher than 100 per cent. Otherwise, the TDR will continue to decline, even if the YDR is at acceptable levels. Excuses may be given for low TDRs. Because a high YDR is easier to achieve, poor performance is more difficult to justify.

#### 3.2 Selection of case studies

The case studies are intended to illustrate the workings and the resulting efficiency of differently sized and structured funds. Three universal-service programs in Asia, with varied administrative structures, funding sources and levies and procedures to disburse funds, were chosen for this purpose. Additionally, the three countries varied demographically and economically. India's population of 1.3 billion is over 36 times larger than Malaysia's and nearly seven times as large as Pakistan's ([World Bank, 2018](#)). Malaysia is an upper-middle-income country, while India and Pakistan are lower-middle-income countries.

The data for the paper were sourced primarily from the latest information available online on the websites of the USFs and regulatory bodies. Requests were made to obtain data on the inflows and disbursements in the Pakistani case.

**3.2.1 Administrative structure.** The Indian Universal Service Obligation Fund (USOF) is administered as a separate administrative organization set up within the Department of Telecommunications, with [The Indian Telegraph \(Amendment\) Act \(2003\)](#) of stating that the Central Government is responsible for the coordination and timely utilization of the funds in the USOF.

The Malaysian Communications and Multimedia Commission (MCMC), the regulatory agency, manages the Malaysian Universal Service Provision Fund (USPF). In Pakistan, the

USF is overseen by the Ministry of Information Technology but is administered by the independent and fully state-owned Universal Service Fund Guarantee Company Limited (USFGC). According to the USF policy, its operation must be technologically neutral unless circumstances require otherwise.

*3.2.2 Funding sources.* The analyzed USFs receive inflows of funds through operators, which means that they actually come from current consumers. When taxes are itemized on customers' bills and simply collected and transmitted to governments, it is clear who the payer is. The operator in this instance is simply the government's tax collector. When levies and taxes are imposed on companies, they do not appear on the bills in itemized form. But they are little different from itemized levies and taxes. The company considers the mandatory levies or taxes as costs, no different from payments made to electricity companies or other suppliers. The business cases for offering services and making investments take into account the mandatory taxes or levies. The returns on investment are calculated based on the cost structure that includes the taxes or levies and the level of competition that determines the prices that can be charged. In addition to keeping prices above where they could be in the absence of levies or taxes and thus reducing quantity supplied, such levies or taxes also depress certain kinds of investments ([Samarajiva, 2010](#)).

In India, 5 per cent of the AGR is levied from all telecommunications service providers, except those who provide pure value added services such as internet, voice mail and e-mail services. An operator is deemed to be a universal service provider if it has a valid license or registration/authorization from the Central Government to provide telecom services or infrastructure. By law, funds may come into the USOF through another mechanism, through grants and loans made by the Central Government. This, however, has not occurred to date.

Malaysia, on the other hand, has determined a minimum revenue threshold. Regulation 27 of the USP Regulations only requires licensees whose net revenue derived from the designated services for the previous calendar year exceeded the minimum threshold of RM 2m (US \$0.61m) to contribute 6 per cent of their weighted net revenue to the USPF. The Communications and Multimedia Act (Universal Service Provision) (Amendment) Regulations 2003 brought international calls, international roaming services, internet protocol telephony and Integrated Services Digital Network (ISDN), among others, within the calculation of the net weighted revenue. Services such as local and national calls, operator assisted calls and internet access charges are excluded when calculating weighted net revenue for this purpose [[Communications and Multimedia Act, 1998: Communications and Multimedia \(Universal Service Provision\) \(Amendment\) Regulations, 2003](#)].

While India and Malaysia have among the highest universal-service tax rates, at 5 and 6 per cent, respectively, licensees in Pakistan must pay a USF charge of up to 1.5 per cent of gross revenues minus inter-operator payments and related authority/Frequency Allocation Board mandated payments as determined by the Government in Pakistan. Access promotion charges may also be an alternative source of funding.

*3.2.3 Modalities of disbursing funds.* In India, any funds received by the fund are first credited to the Consolidated Fund. They are then disbursed by Parliamentary appropriation [[The Indian Telegraph \(Amendment\) Act, \(2003\). No. 8 of 2004](#)]. [Malik and De Silva \(2005\)](#) state that giving statutory status to the USOF helped expedite disbursements. In Pakistan too, the USF Amendment Rules of 2013 provide for funds to be kept in the Federal Consolidated Fund and for the Ministry of Finance to release the funds in accordance with the procedures laid down by the Rules through budgetary mechanisms.

In Malaysia, funds from the USP Fund are disbursed to the designated service providers after claims are made upon the approval from the MCMC, the telecommunications regulator.

## 4. Disbursement efficacy

This section analyzes the collections and disbursements of the three funds to ascertain the efficacy of disbursement. TDRs and YDRs, as described in Section 3 above, are calculated for this purpose[1]. The performance of individual countries is first measured, after which cross-country comparisons are made.

### 4.1 Disbursement rates by country-individual performance

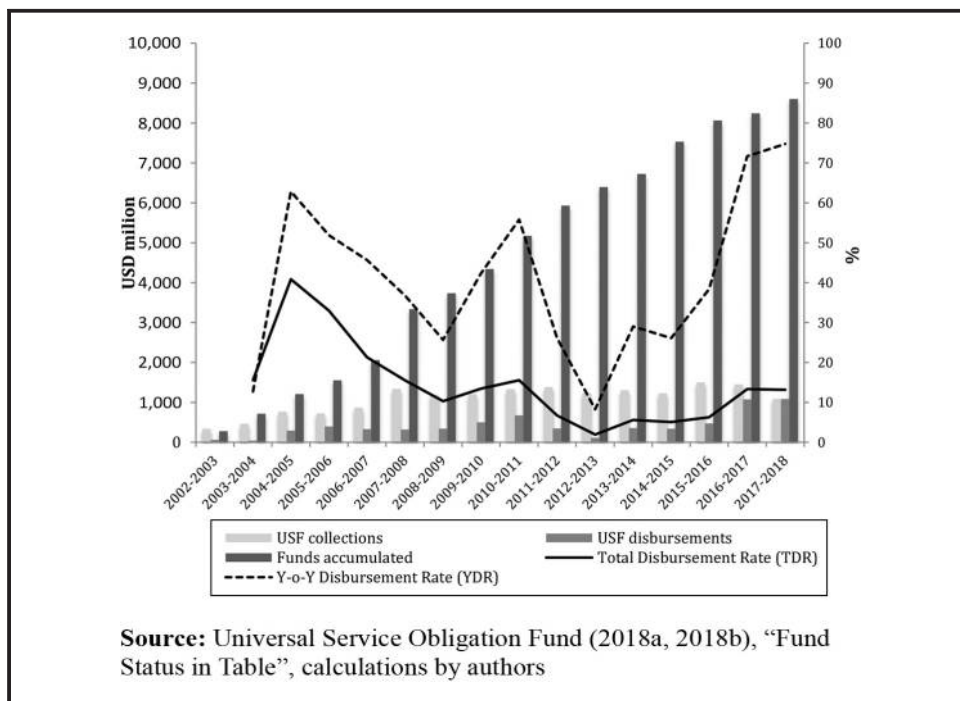
4.1.1 *India.* Figure 2 shows that the inflow of funds to the USOF through Universal Access Levy (UAL) collections grew at a compounded annual growth rate of 10.1 per cent between 2002-2003 and 2017-2018. The increase is caused by growth of top-line revenues of operators in the early periods. While the disbursement of funds has fluctuated, it has constantly been lower than the inflows[2]. In total, 42 per cent of accumulated funds were disbursed in 2004-2005, but that high point has not been matched since. Disbursements picked up in 2016-2017, with the YDR reaching a record high of 75 per cent in 2017-2018.

4.1.2 *Malaysia.* Disbursements in the first five years of operation were extremely low at US\$8.9m, a mere 4.3 per cent of the inflows, being disbursed annually on average (Figure 3). Disbursements increased in 2008, but dropped to US\$13.6m once again in 2009.

Disbursements came close to matching prior-year contributions in 2012 and 2013 yielding YDRs of 98 and 99 per cent, respectively. The YDR nearly halved in 2014, but rose to 79 per cent in 2015. It is noteworthy that the funds disbursed in 2016 exceeded funds collected that year.

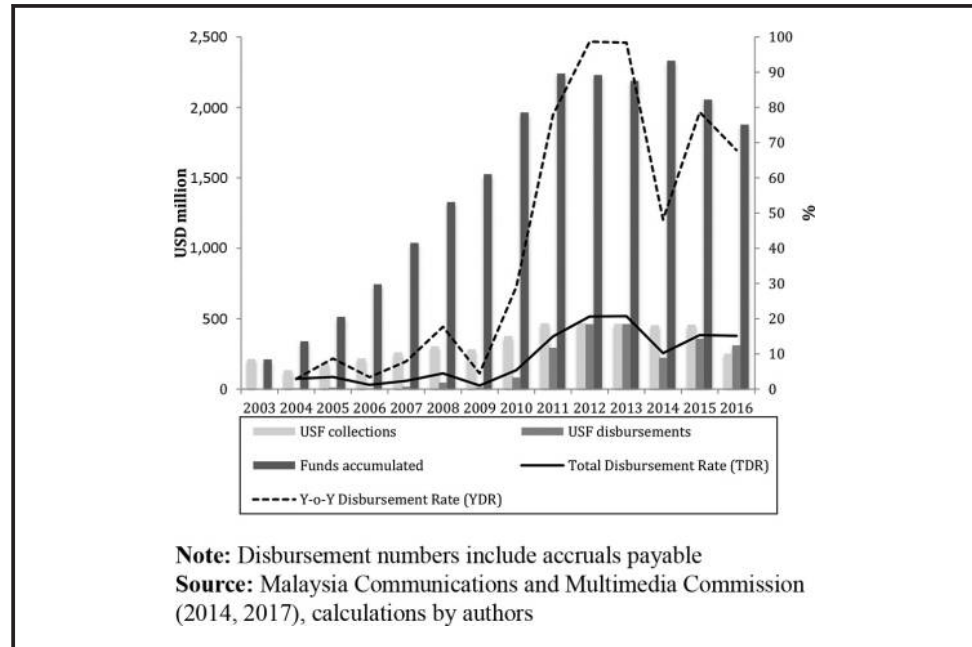
The accumulation of funds over the years prevented the TDR from exceeding 25 per cent in 2012 and 2013. Funds with accumulated balances must achieve YDRs higher than 100 per

**Figure 2** Status of Indian USOF





**Figure 3** Status of Malaysian USPF



cent for several years if they are to improve overall disbursement efficacy as depicted by the TDR. Only Malaysia has come close to achieving that.

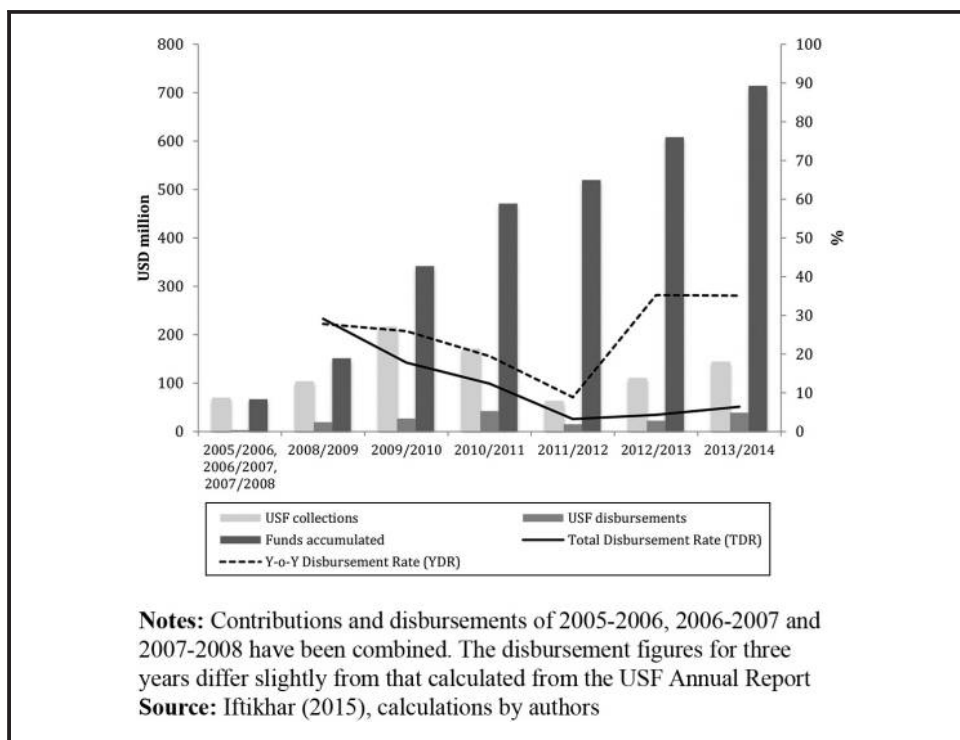
4.1.3 *Pakistan.* Figure 4 shows variations in the inflow of funds into the USF. The highest recorded inflow was in 2009-2010, after which contributions decreased and rose once again. The inflows in 2014-2015 were lower than in the previous year. Usually, contributions to the USF increase year on year, driven by increased operator revenues.

Almost 30 per cent of the funds in the Pakistan USF at the beginning of 2008-2009 were disbursed within the next year. However, the disbursement rate has seen a general downward trend since then. The most recent data indicates that only a fifth of the total inflows are disbursed. Despite the disbursed funds almost doubling (173 percent) between 2012-2013 and 2013-2014, the TDR only increased by 2.1 per cent. The YDR remained stable at 35 per cent for the past two years. Contrary to perception, the Pakistan USF has never been strong in disbursing funds.

#### 4.2 Disbursement rates by country: comparative assessment of performance

Despite admitting the limitations of other USF programs, the World Bank's [Independent Evaluation Group \(2011\)](#) portrays the Pakistan's USFGC as a success, which is surprising. [Tables I and II](#) allow for the performance of the three USFs to be compared with each other over time. Some countries have been more successful than others in pushing out the collected funds. Malaysia, for example, in 2012 and 2013, managed to disburse nearly all the funds it collected in the previous year. India too managed to increase disbursements with both its TDR and YDR more than doubling in between 2015-2016 and 2016-2017. The absence of data for Pakistan beyond 2013-2014 prevents the authors from making statements regarding its performance since 2014. Its TDR and YDR in both 2012-2013 and 2013-2014 were superior to that of India in the same years, though well below that of Malaysia.

**Figure 4** Status of Pakistan USF



**Table I** Comparative TDRs (%)

| India (FY April-March) |       | Malaysia (FY January-December) |       | Pakistan (FY July-June)         |   |
|------------------------|-------|--------------------------------|-------|---------------------------------|---|
| Year                   | TDR   | Year                           | TDR   | Year                            | TDR   |
| 2003-2004              | 15.57 | 2003                           |       |                                 |   |
| 2004-2005              | 40.84 | 2004                           | 2.94  |                                 |   |
| 2005-2006              | 32.96 | 2005                           | 3.45  | 2005-2006, 2006-2007, 2007-2008 | Not calculable, because of lack of data by year |
| 2006-2007              | 21.31 | 2006                           | 1.22  |                                 |   |
| 2007-2008              | 15.53 | 2007                           | 2.32  |                                 |   |
| 2008-2009              | 10.32 | 2008                           | 4.46  | 2008-2009                       | 29.12   |
| 2009-2010              | 13.46 | 2009                           | 1.02  | 2009-2010                       | 17.82   |
| 2010-2011              | 15.55 | 2010                           | 5.39  | 2010-2011                       | 12.38   |
| 2011-2012              | 6.72  | 2011                           | 14.95 | 2011-2012                       | 3.23  |
| 2012-2013              | 1.93  | 2012                           | 20.61 | 2012-2013                       | 4.33  |
| 2013-2014              | 5.60  | 2013                           | 20.71 | 2013-2014                       | 6.41  |
| 2014-2015              | 5.07  | 2014                           | 10.19 |                                 |   |
| 2015-2016              | 6.28  | 2015                           | 15.33 |                                 |   |
| 2016-2017              | 13.34 | 2016                           | 15.12 |                                 |   |
| 2017-2018              | 13.19 |                                |       |                                 |   |

Source: Calculated by authors

## 5. Policy implications

Universal service schemes in most countries are failing. Money is being extracted from current consumers of telecommunication services and is lying fallow in government accounts.

**Table II** Comparative YDRs (%)

| India (FY April-March) |       | Malaysia (FY Jan-December) |       | Pakistan (FY July-June)         |   |
|------------------------|-------|----------------------------|-------|---------------------------------|---|
| Year                   | YDR   | Year                       | YDR   | Year                            | YDR   |
| 2003-2004              | 12.74 | 2003                       |       |                                 |   |
| 2004-2005              | 62.82 | 2004                       | 2.90  |                                 |   |
| 2005-2006              | 51.85 | 2005                       | 8.68  | 2005-2006, 2006-2007, 2007-2008 | Not calculable, because of lack of data by year |
| 2006-2007              | 45.66 | 2006                       | 3.39  |                                 |   |
| 2007-2008              | 36.78 | 2007                       | 7.90  |                                 |   |
| 2008-2009              | 25.66 | 2008                       | 17.68 | 2008-2009                       | 27.79   |
| 2009-2010              | 42.35 | 2009                       | 4.46  | 2009-2010                       | 25.94   |
| 2010-2011              | 55.81 | 2010                       | 29.09 | 2010-2011                       | 19.47   |
| 2011-2012              | 26.11 | 2011                       | 77.91 | 2011-2012                       | 8.86  |
| 2012-2013              | 8.27  | 2012                       | 98.66 | 2012-2013                       | 35.24   |
| 2013-2014              | 29.00 | 2013                       | 98.37 | 2013-2014                       | 35.08   |
| 2014-2015              | 26.11 | 2014                       | 48.14 |                                 |   |
| 2015-2016              | 38.41 | 2015                       | 78.66 |                                 |   |
| 2016-2017              | 71.66 | 2016                       | 67.87 |                                 |   |
| 2017-2018              | 74.75 |                            |       |                                 |   |

Source: Calculated by authors

The poor disbursement performance of a universal service scheme that is portrayed as exemplary, the Pakistan USFGC ([Independent Evaluation Group, 2011](#)), illustrates the seriousness of the problem. This highlights the need to go beyond anecdote to develop proper metrics and issue regular reports that are available to the public. It is only by comparing performance across time and among countries that proper assessments can be made and remedial action taken.

Quarterly or annual public reporting of the type mandated by the FCC ([Goldstein, 2009](#)) is required, ideally using common metrics. This would hopefully lead to questions being raised in the media and in the legislatures. Ideally, the basic information on inflows, outflows and outputs will be made publicly available by fund administrators and perhaps even the YDRs and TDRs published at regular intervals. Regional organizations or think tanks may compile comparative indicators and perhaps even conduct independent assessments of outcomes and outputs. Where Right to Information laws exist, they may be used to obtain the required data.

Remedial actions may include systematic evaluations by national governments or by the funds themselves or by stakeholders and independent think tanks to identify the causes of poor disbursement and overall efficacy of outputs, including whether the money was spent according to program objectives. Obviously, action may have to be taken to improve the administration of the funds. Here, those best positioned to act are within the country and not at the regional or international levels. Given a steady and substantial inflow of funds, there is little excuse for not being able to effectively disburse the money.

The General Agreement on Trade in Services imposes a legal obligation on Members who have committed to the Regulation Reference Paper to ensure that the USO programs they wish to maintain “are administered in a transparent, nondiscriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the Member” ([World Trade Organization, 1996](#)). In the event of a Member invoking GATS dispute-resolution provisions in relation to the above, data on low YDRs and TDRs may support a claim that the impugned USO program is more burdensome than necessary, because it collects far too much money than can be spent to serve the stated objectives.

Levies based on fixed percentages of an ever-increasing base will result in inflows into the USF that will increase year-on-year. The case studies show this occurs, with only a few exceptions. If the objective is the closing of an identified gap and the actions taken by the USF are contributing to its closing, it is difficult to envisage the need for ever-

increasing resources over time. The optimal solution would be a program that is based on the identification of the gap that has to be bridged or the task that has to be achieved, along with a clear description of the desired end state. This could, for example, be that all human settlements above a certain population threshold be provided with wireless coverage.

The case studies show the goal posts have been changed over time. For example, in India, the focus has shifted from the provision of village public telephones to fiber optic cable in the “middle mile.” This could be interpreted as mission creep by the uncharitable or as sensible adjustments necessary in a rapidly changing ICT industry by others.

Even in a sub-optimal solution, there is little justification for a universal-service program that is flooded with ever-increasing funds simply as a result of industry growth. To a great extent, the difficulties of disbursement experienced by all USFs could be attributed to increasing inflows.

One way to control this problem would be to build in automatic step-downs in the percentage (e.g. the Indian levy could be stepped down from the current five per cent by half a percentage point every year). Another solution would be to automatically activate reductions when the TDR goes below a defined threshold. A third solution would be to build in emergency brakes, so that collections cease at specified levels of TDR. The advantage in the first solution is that it can be factored into the business plans of the operators and would thus be helpful in terms of the budget telecom network business model explicated by [Samarajiva \(2010\)](#). Unpredictable windfalls that would result from the second or third solutions cannot be built into business plans. Thus, they are likely to benefit the shareholders of the operators rather than customers or the policy objectives of greater connectivity.

Once enormous balances have accumulated, there is little alternative but to come up with grandiose spending schemes such as BharatNet (formerly known as the National Optical Fibre Network) ([Srinivasan and Ilavarasan, 2015](#)), which accounted for 77 percent of the Indian USOF's disbursements in 2016-2017. This is a sub-optimal solution, but one that is difficult to avoid once massive balances have been built up. Preventing accumulation is thus an important element of effective universal-service policy. Metrics that will help keep track of disbursement efficiency and of accumulation, as proposed in this article, are thus essential for the formulation of good universal-service policy and for their effective implementation.

## Notes

1. The calculations are made in the local currency, and then converted to USD at the average exchange rate of the relevant period for comparability.
2. The reimbursements of license fees and spectrum charges (to BSNL) were not taken into consideration when calculating the disbursement rates. They were merely accounting allocations; the USOF states that the negative fund balance was only notional.

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