Palestinian territories:
Impact of fiscal and economic policies (P170534)

Estimation of VAT Tax Gap

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Acronyms

DG	Director General
FC	Final Consumption
GCF	Gross Capital Formation
GDP	Gross Domestic Product
LGUs	Local Government Units
MENA	Middle East and North Africa
MoF	Ministry of Finance
PA	Palestinian Authority
PCBS	Palestinian Central Bureau of Statistics
RMS	Revenue Management System
SUT	Supply-Use Tables
VAT	Value Added Tax
TADAT	Tax Administration Diagnostic Assessment Tool

Executive Summary

The relatively low level of tax revenues is a key policy issue facing Palestinian policymakers. The general government revenues to GDP ratio in the West Bank and Gaza is significantly below the world average, the Middle East and North Africa (MENA) average, and the average of emerging and developing countries in Europe.

Further to the request by the Minister of Finance, the World Bank team launched an assessment of several aspects of tax policy in the West Bank and Gaza. This analytical piece was going to have three parts: a microsimulation model for income tax on wages, another microsimulation model for income tax on profits, and the VAT GAP model. While this report covers the third component, the other two are dependent on a level of systematization of data which currently does not exit. Manual entry of data into the Revenue Management System (RMS) is generating a lot of missing observations. While this could have been overcome with follow up appropriate sampling of the physical tax records and manual collection of data, the restrictions on movement due to the Covid-19 pandemic prevented such work.

The main contribution of this is the development of the VAT Gap model for West Bank. This is a relatively straightforward model that utilizes Excel to determine the potential for VAT tax collection and compares it to actual VAT collections by the MoF, with the difference indicating the VAT Gap. The model utilizes the Supply and Use Tables produced by the PCBS to calculate the former while the actual VAT collection data from the MoF is used for latter.

The VAT Gap can further be broken down into the VAT Policy Gap and the VAT Compliance Gap. The VAT Policy Gap is the difference between the Potential VAT collectible under a benchmark regime of VAT (where there are no exemptions, lower rates or special treatment of any type of consumption) and the Potential VAT collectible under the current regime. The VAT Policy Gap estimates the revenue foregone due to the current policy of the government. The VAT Compliance Gap is the difference between this Potential VAT collectible under the current regime and the Actual VAT collection. The VAT Compliance Gap estimates the gap in VAT due to non-compliance by taxpayers.

The tax gap is an indication of fiscal risk and scope for revenue mobilization. By identifying compliance and policy gaps separately, the tax gap helps identify appropriate treatments and risk management strategies. The policy gap, and particularly the VAT expenditure gap, is key to understanding the fiscal impact of current policy choices. A complementary tax expenditure estimation for the public budget would provide a more detailed costing of each particular tax measure. The compliance gap is key to assessing the overall effectiveness of a revenue administration. This gap indicates the effectiveness in maximizing revenue collection within the given policy framework.

The results indicate that there is a large VAT gap (13 percent of GDP) which predominantly consists of the VAT Compliance Gap (9 percent of GDP) and the remainder of the VAT Policy Gap (4 percent of GDP). For 2019, Potential VAT in the benchmark scenario is estimated at 19 percent of GDP, while Potential VAT under current policy is estimated at 15 percent of GDP. Current collections in the West Bank, both on domestic VAT and relevant share of the import VAT, are 6 percent of GDP. This implied a VAT Policy Gap of 4 percent of GDP (19 percent – 15 percent) and a VAT Compliance Gap of 9 percent of GDP (15 percent – 6 percent). Interestingly, more than half of the VAT Compliance Gap is explained by uncollected VAT on imports.

1. Introduction and background

The relatively low level of tax revenues is a key policy issue facing Palestinian policymakers. The general government revenues to GDP ratio in the West Bank and Gaza is significantly below the world average, the Middle East and North Africa (MENA) average, and the average of emerging and developing countries in Europe. An important reason behind the low revenue ratio is related to the amount of tax revenues collected in Gaza, which is significantly lower than that in the West Bank. Nevertheless, even without these losses, general government revenue in the West Bank is lower than most relevant comparators.

Total revenues for the past five years have averaged around 22 percent of GDP with two-thirds of it collected by Israel. Taxes that Israel collects on behalf of the Palestinian Authority (PA)—so called clearance revenues—represent the largest share of tax revenues, and they have averaged around 14.4 percent of GDP, with revenues collected by the PA domestically averaging around 7.7 percent of GDP. Of these domestic revenues, 3.1 percent of GDP are revenues on various fees and charges and the remaining 4.6 percent are revenues from domestic taxes. The breakdown of PA's tax revenues is given in table below.

Table 1: Palestinian territories: Collection of tax revenues (percent of GDP)

	2015	2016	2017	2018	2019	Avg.
Domestic Revenue	6.5	8.5	7.6	8.3	7.4	**7.7**
Tax Revenues	4.3	4.1	4.7	5.2	4.6	**4.6**
Income Tax	1.3	1.1	1.4	1.5	1.3	**1.3**
Value Added Tax	1.8	1.6	1.7	2.1	1.8	**1.8**
Customs	0.8	1.1	1.3	1.2	1.1	**1.1**
Excise on tobacco	0.3	0.3	0.3	0.4	0.4	**0.3**
Non-tax Revenues	1.8	3.9	2.4	2.7	2.2	**2.6**
Earmarked revenue for LGUs	0.4	0.5	0.5	0.5	0.6	**0.5**
Clearance Revenues	14.7	15.2	15.0	13.9	13.4	**14.4**
Customs Taxes	5.4	5.4	5.8	6.0	6.0	**5.7**
Value Added Tax	4.2	4.6	3.9	3.4	3.5	**3.9**
Excise Tax on Petroleum	5.1	5.0	5.0	4.3	4.3	**4.7**
Income Tax	0.0	0.1	0.3	0.1	0.4	**0.2**
Other	0.0	0.1	0.0	0.1	-0.8	**-0.1**

The Palestinian Ministry of Finance administers the collection of domestic tax revenues, but despite accounting for just one-third of tax revenues, it suffers from fragmentation and developing systems. Currently, revenue function is split by tax type among three Director Generals (DGs). DG for Income tax administers both income tax on wages and income tax on profits. Value Added Tax, Customs and Excise are with another DG, while property tax is with the third DG. The Revenue Management System (RMS) is used in the first two DGs, while property tax has its own system. Income tax on wages constitutes majority of income taxes and those are administered through companies as they withhold it from wages and pay it to the tax authority monthly. Income taxes on profit are levied on companies themselves and they are paid

annually though filing of tax returns. Up until 2020, all data on income taxes on wages, income taxes on profits and value added taxes was entered manually into the RMS by the staff. From 2020, companies can file income tax on wages and VAT electronically through an e-portal.

These challenges in tax administration constrain analytical work on tax revenue. A more comprehensive analytical package would have three complementary parts: microsimulation model for income tax on wages, microsimulation model for income tax on profits, and VAT GAP model. While this report covers the third component, the other two are dependent on a level of systematization of data which currently does not exit. Manual entry of data into the RMS is generating a lot of missing observations. The MOF DG for Income tax shared 35,000 tax returns for income tax on profits collected for 2018, the last complete tax year. Each tax filing is accompanied with financial statements from the company but starting point for entry is the net revenues and not any other item. Consequently, data on gross income, depreciation or tax loss carried forward is not captured electronically but is kept in physical files. Further, while the RMS has the ability to collect data on various tax exemptions, often the data is not entered. In addition, data for tax due exists, but data on actual tax collected does not. With regards to the income tax from wages, RMS has data for some 900,000 individuals but only for gross income and tax due, and not on various exemptions. Thus, the actual tax base cannot be determined.

While frustrating in terms of scope for analysis, the identified data challenges relate to fundamental deficiencies in tax administration. In particular, the absence of a unified tax administration (instead spread across three DGs) and the numerous missing variables in tax data are indicative of a system that is missing some building blocks of an effective tax administration strategy and the design of tax instruments. A program of associated reforms could be designed to create a unified tax administration and digitization of the tax system which would yield substantial benefits for the PA. This context would be well-suited to application of the Tax Administration Diagnostic Assessment Tool (TADAT).[1]

The remainder of this report is organized as follows. The following section will describe the methodology for estimation of a VAT tax gap. Section 3 will describe the data sources used for the construction of VAT GAP model for the West Bank and the modifications that were necessary to estimate the VAT tax gap. The final section will present the results.

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[1] https://www.tadat.org/home

# 2. Definitions and methodology for estimating VAT tax gap

What is a tax gap?

The difference between potential collections of a tax and actual collections of the same tax is a simple definition of any tax gap. To be more precise, a tax gap is the difference between

1.   the potential collections that would result if all relevant activity (or income or assets) were taxed at the standard rate, with all taxpayers being fully compliant, and
2.   the actual collections measured on an accrual basis.

Generally, the first component needs to be estimated, while the second can be derived from tax record data. Determining the first component is easier to do for some taxes than others, as it is easier to determine what the standard rate is for some taxes than others. For example, the standard rate is easy to determine for a Value Added Tax (VAT), as it is the tax rate at which activities will be taxed unless otherwise specified. However, the standard rate for a progressive income tax structure can be hard to determine. The relevant activity (or income or assets) will also vary by tax type, but it is typically straightforward to identity as it is inherently connected to the type of the tax. For example, for a typical VAT, the relevant activity subject to taxation would be the domestic final consumption, while for a typical personal income tax, the relevant activity (or income or assets) would be all income realized by natural persons. The following diagram can be used to illustrate the definition of the tax gap.

Figure 1: Illustration of a tax gap
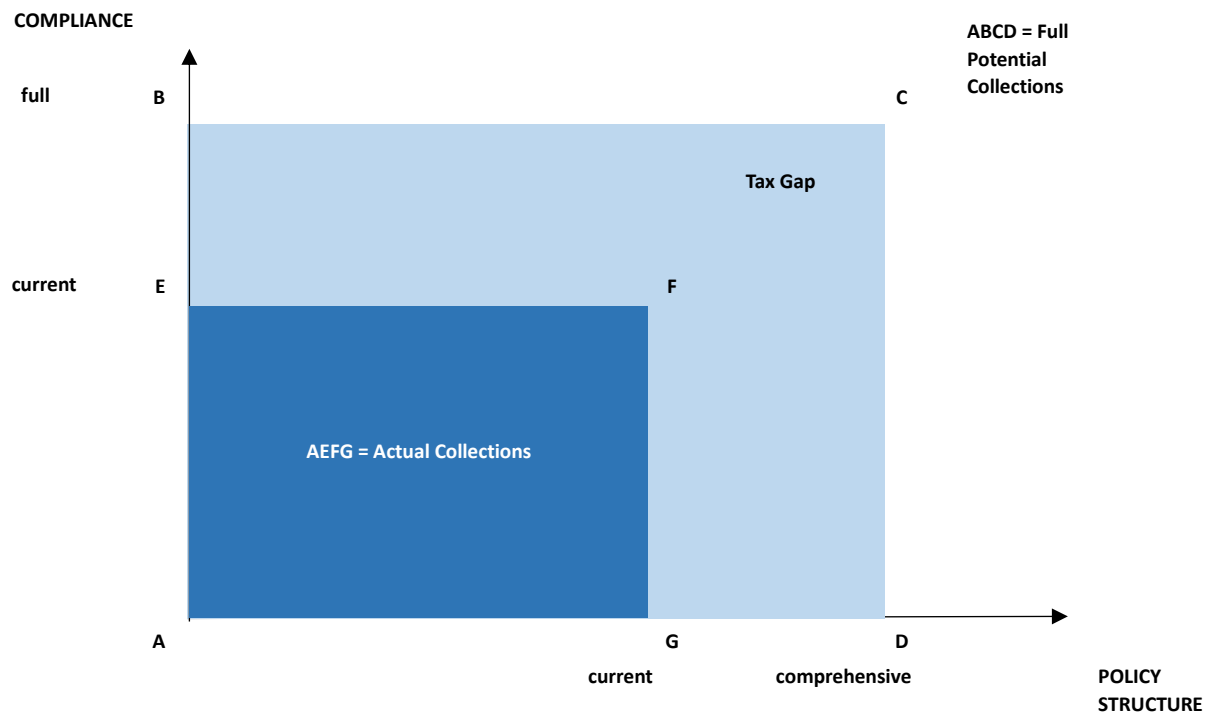
By incorporating a slightly different definition for potential collections, Current Potential Collections, which are the potential collections that would result if all relevant activity/income/assets were taxed as per the current tax policy structure, with all taxpayers being fully compliant, we can break the tax gap into two components: 1) the compliance gap; and 2) the policy gap, as illustrated below.

Figure 2: Illustration of tax gap components
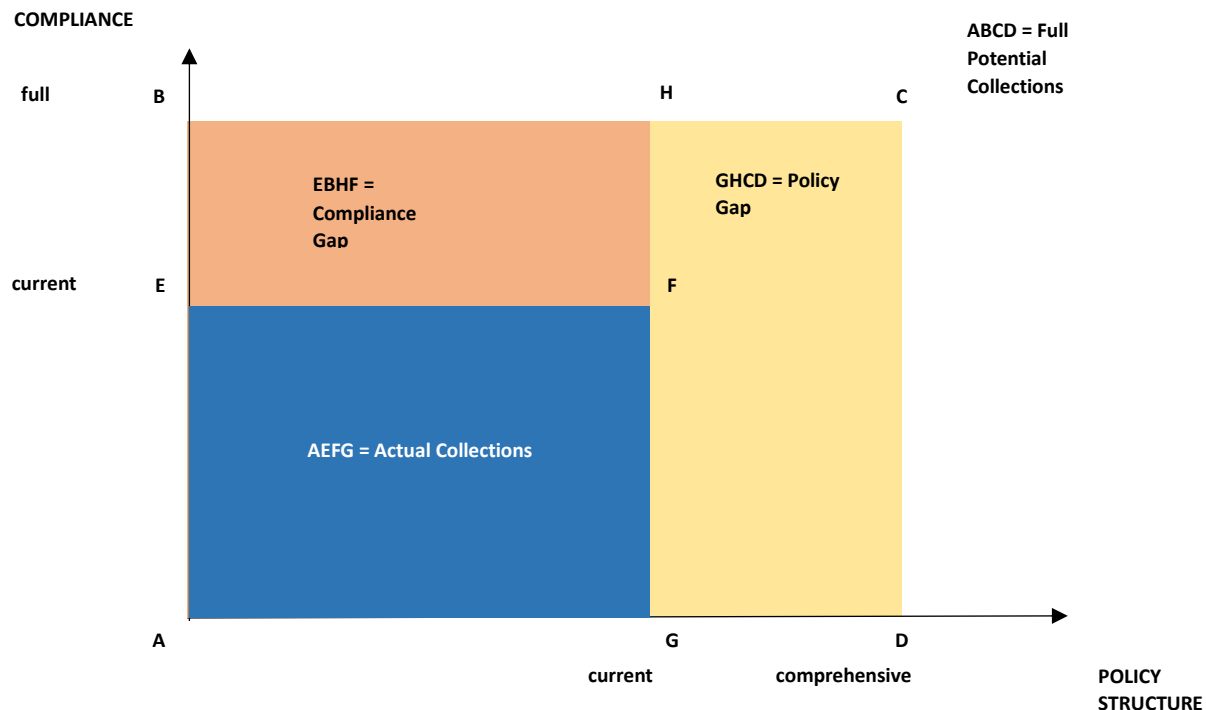
The tax gap is an indication of fiscal risk and scope for revenue mobilization. By identifying compliance and policy gaps separately, the tax gap helps identify appropriate treatments and risk management strategies. The policy gap, and particularly the expenditure gap, is key to understanding the fiscal impact of current policy choices. A complementary tax expenditure estimation for the public budget would provide a more detailed costing of each particular tax measure. The compliance gap is key to assessing the overall effectiveness of a revenue administration. This gap indicates the effectiveness in maximizing revenue collection within the given policy framework. Overall, estimating the tax gap helps in assessing changes in effectiveness. Systematic assessment of the tax gap allows for assessing trends—thus it is also a component of results-based management for an administration. Knowing these things is important for: i) Policy makers, as they assess the effectiveness of their policies; ii) Tax Administrators, as they assess the effectiveness of their administrations; iii) The general public, as they assess the fairness of the taxes they are subject to.

Moving from looking at the tax gap in general, to the specific case of the Value Added Taxes, we can define the VAT Gap in a similar manner. The VAT Gap can be broken down into the **VAT Policy Gap** and the **VAT Compliance Gap**. The VAT Policy Gap is the difference between the **Potential VAT collectible under**

a benchmark or standard regime[2] of the VAT (where there are no exemptions, lower rates or special treatment of any type of consumption or sector/class of taxpayers), and the **Potential VAT collectible under the current regime**[3] (which includes any special treatment of consumption or sector/class of taxpayers). The VAT Policy Gap estimates the revenue foregone due to the current policy of the government. The VAT Compliance Gap is the difference between this **Potential VAT collectible under the current regime** and the **Actual VAT collection**. The VAT Compliance Gap estimates the gap in VAT due to non-compliance by taxpayers. In this note we aim to estimate both the Policy Gap as well as the Compliance Gap.

Detailed methodology for the estimation of the VAT Gap can be found in Annex I.

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[2] Benchmark VAT system is a VAT applied to all domestic consumption taxed at the standard rate of the country. No exemptions, lower rates or special treatment are applied to different classes of taxpayers. The only exception is a zero-rate applied to exports as this is consumption outside the country and does not come under the benchmark VAT system which only taxes domestic consumption.

[3] Current Policy is the VAT applied under the VAT law applicable to the country. This would include any exemptions, special rates or special treatment for different classes of taxpayers.

3. Data, transformations and assumptions

Data

The core data for the Palestinian territories VAT model are the 2017 Supply Use Tables (SUT) produced by the Palestinian Central Bureau of Statistics (PCBS), complemented with additional information from the Ministry of Finance (MoF) on VAT collections.

The Supply Use Tables (SUTs) for Palestinian territories are constructed from two separate tables, one for West Bank and one for Gaza. Both tables have identical dimensions (i.e. the same number of commodities and the same number of sectors) and are additive by construct. They show the Supply matrix in basic prices and the Use matrix in purchaser prices. The difference between the two is typically commodity taxes (net of subsidies) and margins (transportation, retail, wholesale etc.).

The PA also provided a detailed breakdown of domestic VAT collections by sector for the West Bank. The World Bank staff constructed a concordance table between the sectoral breakdown VAT provided by the MoF and the commodities in the SUT tables. Wherever possible, the tax collection was used as the basis for calibrating the Palestinian territories VAT model. Using these two data sources, the World Bank team assembled the data required to prepare the VAT model. The modelling exercise revealed some anomalies and inconsistencies in the data, so when necessary, the team made assumptions based on a few core principles.

Given the data for domestic VAT collections exists only for the West Bank, we will be using the SUT table for the West Bank in order to estimate the potential VAT. In order not to overestimate the gap, we assign the correct proportion of the import VAT to the actual VAT collections for the West Bank.

Data transformations and assumptions

The following transformation to the data were carried out:

- Aligning the years for SUT and VAT collections: SUTs are for 2017 while actual VAT collections are for 2019. We used the consumption growth from 2017 to 2019 to adjust the SUT to 2019.
- Construction of a concordance table for the VAT collections: breakdown of the VAT collections for 2019 exists according to the economic classification that has 33 categories, while the SUT has 22 commodities. See Annex II for details.
- Construction of the effective tax rate by commodity: for each of the commodity categories in the SUT, an effective VAT rate was calculated by considering the amount of goods and services that are exempt, or taxes at the zero rate, under the existing tax law. For example, fruits and vegetables are exempt from VAT. Using Household Expenditure and Consumption Survey, we find that they constitute some 17 percent of entire Agriculture, forestry and fishing commodity in the SUT. Multiplying the share of non-exempt part of that commodity with the standard rate of 17 percent we get an effective rate of 14.1 percent. See Annex III for details.
- Import VAT: As mentioned, sectoral breakdown for VAT collections exists only for the domestic VAT collected in the West Bank. The PA currently does not collect any domestic VAT for Gaza. However, import VAT (one of the taxes making up clearance revenues that Israel collects on behalf of the PA) is transferred to the PA MoF in the West Bank. In order to properly account for this VAT, two

transformations were necessary. First, it was necessary to split the import VAT between West Bank and Gaza according to the corresponding trade flows and then to allocate the West Bank's share of the Import VAT to SUT commodities in order to match the domestic collections as well. Data from the SUT has the breakdown of Import VAT between two different territories which was used to split the Actual import VAT between two territories. Further, the import VAT is allocated to each commodity according to the share of each industry's use of that commodity in the total use. There seems to be an error in the SUT tables as they report much higher Import VAT than the actual collections of the import VAT, which is mostly explained by the lumping of excise taxes with the import VAT taxes. See annex IV for details.

The following transformation to the Supply and Use tables were carried out to arrive at the potential VAT as outlined in the previous chapter on methodology:

- Exemptions were calculated to remove supplies that are not part of the VAT.
- VAT was removed from the intermediate demand from the Use table.
- VAT was removed from the Final Consumption vector and Final Consumption vector was allocated into the commodity/industry matrix.
- Similarly, Gross Fixed Capital Formation vector was allocated into the commodity/industry matrix.
- This allows for calculation of the Input Tax Credits that are disallowed due to exempted supplies.
- Finally, potential VAT was calculated by summing up the final consumption and disallowed Input Tax Credits and multiplying the sum with the relevant effective tax rate.

4. Results

Table below gives an overview of the results of the VAT GAP model for the West Bank.

Table 2: Summary of the results

USD million	VAT Potential			VAT GAP	
	Benchmark	Current Policy	Actual Collection	Policy Gap	Compliance Gap
VAT Potential					
- from Final Consumption	2,605	1,919			
- from blocked Input Tax Credits	0	161			
Total VAT (including Imports)	**2,605**	**2,080**	**842**	**524**	**1,238**
of which, VAT on imports	1,344	1,306	545	37	761
Gap (in percent of potential)		**80%**		**20%**	**60%**
Gap (in percent of GDP)	**19%**	**15%**	**6%**	**4%**	**9%**

The main takeaways from the model results are:

1. The VAT compliance gap is substantial, estimated at 9 percent of GDP, representing sizable forgone revenues from weak compliance.

2. Interestingly, more than half of the compliance gap is from VAT on imports. The large gap on imports can be explained by two issues:

   a. The high rate of undervaluation by Palestinian importers. Given that Palestinian customs agents are not present at the points of entry, they are unable to inspect Palestinian imports and conduct revaluations. Since 2014, the GoI has been sharing data on Palestinian imports cleared by Israeli customs with the PA on a daily basis. This has enabled Palestinian customs officials to conduct post clearance audits and develop a risk management system. Nevertheless, undervaluation of Palestinian imports is still prevalent and mirror trade data indicates that declarations by Palestinian importers are 32 percent lower, on average, than those submitted by trading partners. Notably, mirror statistics confirm that undervaluation of Israeli goods is much lower at 23 percent, which suggests that Israeli clearance agents apply more stringent inspections to Israeli bound goods compared to those destined to Palestine. This results in annual revenue losses for the PA.

   b. VAT losses related to trade with Israel. Under the Paris Protocol, goods traded between the PA and GoI are subject to the VAT rate applicable at the selling market. The VAT clearance procedure instituted by the protocol requires that the invoices that were received by the buyer at the time of the transaction be presented during the clearance session in order for the claiming side to receive its VAT revenues. However, Palestinian buyers do not always pass on to the PA the invoice that they receive from the Israeli sellers at the time of the transaction to avoid declaring sales on these goods, and hence, lower their local VAT and income tax obligations. In addition, since the internal divide between the West Bank and Gaza in 2007, the PA has rarely received invoices from

businesses in Gaza because its tax officials have not been able to operate there. Consequently, the PA ends up unable to claim VAT recorded in these missing invoices during the clearance sessions, which leads to significant revenue losses. Implementing the Protocol's provisions regarding information sharing could significantly reduce tax leakages on bilateral trade. The GoI and the PA would start exchanging full information on the invoices submitted to them by registered businesses. In fact, the protocol clearly states that "Each side will provide the other side, upon demand, with invoices for verification purposes."[4] This exchange of information will inform each tax authority about the actual amount of VAT paid by its registered businesses rather than what was reported to it. It will also enable tax officials to go after businesses that do not report their purchases and take legal action against them.

c. The on-going work of the VAT Law Review committee, that is being assisted by experts from UK's Department for International Development, would be beneficial to improve the compliance as it would update the current law that is based on 1975 Israeli VAT Law. This work would not only provide important upgrading of the law and increase legal clarity of this important tax policy, but it would also draft and propose necessary by-laws for a more efficient administration of the updated VAT Law.

3. Looking at goods and services that have the largest compliance gaps, top three categories are: trade, manufacturing, and agricultural goods and services.

4. The VAT policy gap is not as nearly as large, but it still estimated at 4 percent of GDP. This is to be expected as there are no major goods or services that are exempted. The majority of the policy gap is actually accounted for by the goods and services produced by the public sector, which is exempt from VAT, which does not leave a great amount of room for new revenues.

In summary, the results indicate that there is a large VAT gap (13 percent of GDP) which predominantly consists of the VAT Compliance Gap (9 percent of GDP) and the remainder on VAT Policy Gap (4 percent of GDP). For 2019, Potential VAT in the benchmark scenario is estimated at 19 percent of GDP, while Potential VAT under current policy is estimated at 15 percent of GDP. Current collections in the West Bank, both on domestic VAT and relevant share of the import VAT, are 6 percent of GDP. This implied a VAT Policy Gap of 4 percent of GDP (19 percent – 15 percent) and a VAT Compliance Gap of 9 percent of GDP (15 percent – 6 percent). Interestingly, more than half of the VAT Compliance Gap is explained by uncollected VAT on imports.

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[4] Article VI (6) and (10) of the Paris Protocol on information sharing.

Figure 3: Goods and services with largest compliance gaps (in USD million)
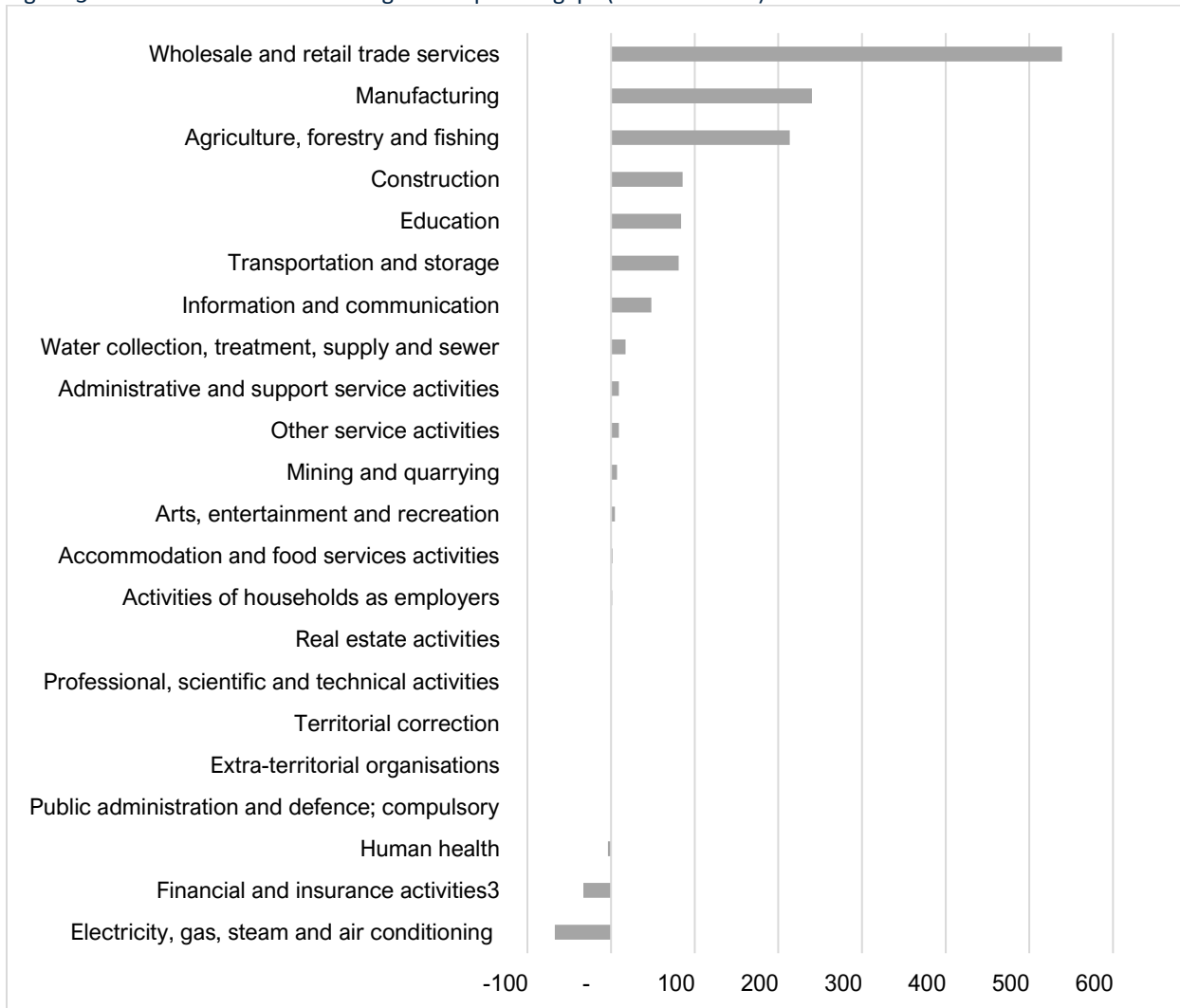
5. Policy recommendations

Based on the analytical results (as opposed to a comprehensive diagnostic), the following are proposed as tentative policy recommendations:

1. To reduce VAT Compliance Gap, consider expediting drafting and updating the current Israeli VAT law as applied in the Palestinian territories. Several Gulf Cooperation Council (GCC) countries have in the past couple of years have adopted and introduced VAT for the first time. They have modern VAT laws in a customs union context that can serve as a basis for a VAT law to be adopted in Palestinian territories, that could then be brought into line with the policy requirements of the prevailing Israeli law.

2. Consider maintaining the current simple rate structure and minimize exempted activities in order to lower the VAT Policy Gap; this would also simplify the harmonization of any new VAT law with Israel.

3. Once the new VAT law is adopted, expedite work on necessary by-laws in order to further clarify and strengthen VAT tax procedure, something that is currently not in place.

4. Continue efforts to introduce electronic exchange of VAT information between GoI and the PA in order to reduce tax avoidance on imports, noting that the size of the compliance gap makes it a critical element of the overall "fiscal leakages" file.

5. Consider carrying out Tax Administration Diagnostic Assessment Tool (TADAT) in order to identify more detailed areas for improvement of tax administration. TADAT provides a 360-degree diagnostic of the performance of a tax administration using nine performance areas which contain 28 indicators. This approach benchmarks current performance against international peers in a manner that is similar to the recently completed Public Expenditure and Financial Accountability (PEFA) assessment. TADAT would strongly complement existing engagements on public financial management.

Annex I: Detailed methodology for estimating VAT Gap

In order to calculate the potential VAT, we apply the VAT policy, either benchmark or current policy, to the consumption of the different commodities or services.

*Potential VAT = Final Consumption * Tax Rate*　　　　　　　　　　　　　　*eq. (1)*

The potential VAT could also be derived alternatively which links the consumption side with the production side that generates the goods and services being consumed. The Supply-Use Tables that form part of the national accounts provides the information of the final consumption as well as the production and use of goods and services in the economy.

Figure 4: Illustration of Supply-Use tables

SUPPLY TABLE　　　　　　　　　　　　　　　**USE TABLE**
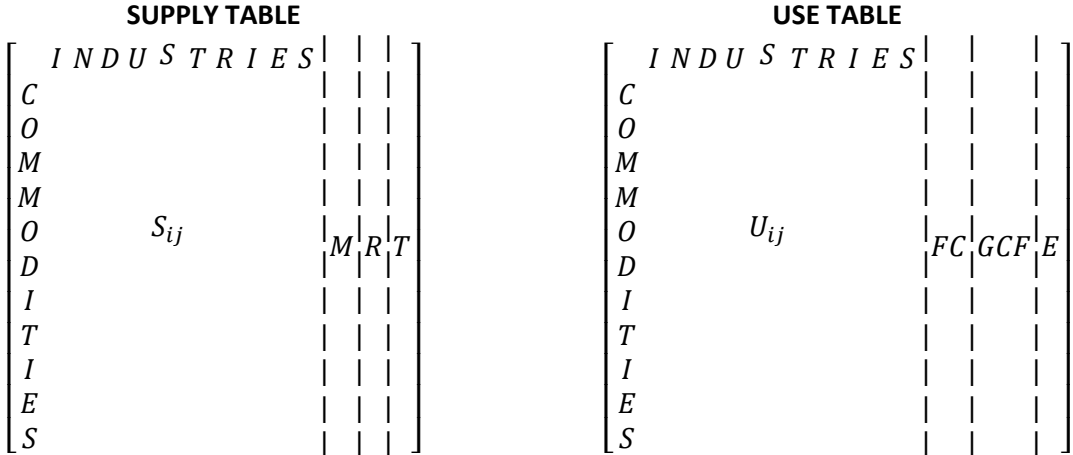
Supply Table: Supply Table shows the supply of all 'm' commodities into the economy with the supply of commodities shown in rows and the 'n' industry/sectors that supply them in columns. Hence cell [5,7] would show the supply of commodity '5' by industry '7'. Supply could be from domestic production or from Imports. In the figure below, Domestic production/supply is shown below as a 'm' x 'n' matrix $[S_{ij}]_{mxn}$ by the 'm' Commodities and the 'n' Industries that supplies these commodities. Imports (M) are shown by commodity in one column though in some countries, it may also be provided in an 'm' x 'n' matrix showing the imports of 'm' commodities by each of the 'n' industries. The Supply Table also includes by commodity, the Trade/Transport margins (R) and the tax or subsidies by commodity (T). Here too such column vectors could also be available as an 'm' x 'n' matrix.

Use Table: The Use Table provides the use of commodities in the economy. Use of commodity is shown in the figure below as Use of commodity by Industry (Intermediate Use) represented as an 'm' x 'n' matrix $[U_{ij}]_{mxn}$, use by Final Consumers (FC), use for Gross Capital Formation (GCF) and finally use by Exporters (E) shown as column vectors. Here too it is possible that the Gross Capital Formation and Exports are shown as an 'm' x 'n' matrix showing the sectors that use or export these commodities respectively.

Consequently, potential VAT can be written as follows:

$$Potential\ VAT = \sum_c(\text{Final Consumption (FC)} * \text{Tax Rate } (\tau_c)) \qquad eq.\ (2)$$

Where τ_c is a column vector of the rates of VAT that is applied to the m commodities. This also allows us to obtain the potential VAT for each of the 'm' commodities. This is known as the **consumption approach** for calculating the potential VAT.

Potential VAT could also be calculated by industry **(production approach)**. However, this requires the information in eq. (2) to be converted into a 'm' x 'n' matrix form. Further, it would also be useful to also get the various components of the VAT calculation from the point of view of the business/industry paying the VAT. This requires the use of the identity that the **total Supply of a commodity should be equal to its total Use**.

From the Supply and Use Tables this implies,

$$Domestic\ Supply\ (S) + Imports\ (M) + Margins\ (R) + Tax\ (T) = Intermediate\ Use\ (U) +$$
$$Final\ Consumption\ (FC) + Gross\ Capital\ Formation\ (GCF) + Exports\ (E) \qquad eq.\ (3)$$

Note that as the supply of each commodity shown in the Supply table includes taxes which is equal to the use of each commodity as shown in the Use table, **taxes on the commodity is included in the use of each commodity**. These taxes include the VAT. This means that the Final Consumption vector shown in the Use table includes the VAT as well as other taxes levied on commodities such as excise taxes and customs duty. As the base of the VAT includes all taxes embedded in the prices of the commodity, Final consumption in equation (2) is related to the Final Consumption vector (FC) in the user table as follows:

$$Final\ Consumption = FC - VAT^5 \qquad eq.\ (4)$$

Where the VAT a column vector that is the embedded VAT in the Supply table by commodity.
From equations (2), (3), and (4) we can obtain,

$$Potential\ VAT = \sum_c(\text{Final Consumption (FC)} * \text{Tax Rate } (\tau_c)) =$$

$$\sum_c \{\tau_c \text{ x [Supply (S) - Exports (X)]} - \tau_c \text{ x [Intermediate Use (U)} + \text{Gross Capital Formation (GCF)}$$
$$- \text{Tax (T)]} + \tau_c \text{ x Imports (M)}\}$$
$$eq.\ (5)$$

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[5] It may seem odd that we need the VAT data in order to calculate the VAT potential. The Supply Use Table is prepared for the purpose of national accounts and the amounts and prices that are used to construct them are derived from surveys and actual data obtained from firms and households. The VAT that is part of these tables are the actual VAT paid. We intend to use the Supply Use Table to estimate the potential VAT and hence need to strip the tables of the embedded VAT.

Note that the sum of Margins across commodities $\sum_c R_c$ = 0, as any positive Trade/Transport margin paid by the non-Trade sector is balanced by positive margins earned by the Trade sectors. Hence this term does not appear in (5).

As column vectors, (GCF), (M) and (T) could be allocated to industries, they could be converted to rectangular matrices, [GCF]ₘₓₙ , [M]ₘₓₙ and [T]ₘₓₙ . Hence the right-hand side of Equation (4) would be an 'm' x 'n' which when added across all the rows (commodities) allows us to summarize the VAT Potential by industry.

This means that the VAT potential could be obtained by industry and which allows us to compare it to actual VAT Collection which is typically available by industry from the tax administration.

Supply-Use Tables and the treatment of Gross Fixed Capital for households: Gross Fixed Capital (GFC) is shown as a column vector in the Use table and shows the use of various commodities to create Fixed Capital. The use of the commodity into capital is because capital lasts beyond the current year unlike consumption.

However, GCF is either used by business where it forms part of their business inputs or by governments and households. Where governments are represented as an industry referred to as 'Public Administration…", such capital inputs would also be costs in their budgets. Hence any entry in the GFC column could be allocated to the different industries. In the case of households however, GFC no such allocation of inputs is possible and hence GFC 'used' by households need to be reflected as final consumption. This is especially relevant for GFC created by the construction sector and household 'consumption' of the capital created by the construction sector would be houses built for households.

Complexities associated with VAT Policies: Under a benchmark VAT regime, equation (2) would be enough to estimate the VAT Potential. Estimating the VAT Potential under current VAT policy is more challenging because VAT Policy may include exemptions.

Under VAT policy, any business providing exempt supplies are not allowed to claim input tax credit to the extent of their exempt supplies. If this exempt supply is an intermediate good then it implies for example, that a business selling 40 percent of their supplies of this intermediate good that are exempt are not allowed to claim 40 percent of their input tax credits. However, this business would continue its activities which eventually result in final consumption. This means that while VAT is collected on final consumption, the disallowed input tax credit implies additional revenue for the government. Hence,

$$Potential\ VAT\ under\ current\ law = \sum_c (\text{Final Consumption (FC)} \, * \, \text{Tax Rate } (\tau_c))$$
$$+ \ Disallowed\ Input\ Tax\ Credit \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad eq.\ (6)$$

Where τ_c is a column vector of the rates of VAT applied to the 'm' commodities where the entries are zeros where supplies of such commodities are exempt. Equation (5) is applicable when the supply of the commodity that is exempt is an intermediate good. However, when the commodity is a final consumption good it only results in reduced tax without the additional tax from the disallowed input tax credit.

Notation – individual cells of the Supply (S) and Intermediate Use (U) matrices are referred to by commodity 'c' as well as industry 'i' and is denoted as S_{ci} and U_{ci} respectively. Column vectors given by

commodity have the subscript 'c' such as E_c for Exports, Trade/Transport Margins R_c , Imports I_c, Gross Fixed Capital Formation I_c , Imports M_c and Taxes T_c. Row vectors are given by industry subscript have the subscript 'i'. $U_{.i}$ is the summation of intermediate use across all commodities for industry 'i' i.e. total intermediate use by industry 'i' while $S_{.i}$ is the summation of supply across all commodities for industry 'i' i.e. total supplies by industry 'i'. Similarly, $U_{c.}$ is the summation of intermediate use across all industries of commodity 'c' i.e. total intermediate use of commodity 'c' while $S_{c.}$ is the summation of supply across all industries of commodity 'c' i.e. total use of commodity 'c'.

Figure 5: Sector-wise Use: Summation across commodities of Supply Table

Industry → Commodity ↓	Agriculture	Manufacturing	Trade	Hotel			Investment		
Agricultural commodities									
Manufactured commodities									
Wholesale Trade Services									
Tourism Services									
	$S_{.1}$	$S_{.2}$	$S_{.3}$	$S_{.4}$					

Figure 6: Sector-wise Use: Summation across commodities of Use Table

Industry → Commodity ↓	Agriculture	Manufacturing	Trade	Hotel			Investment		
Agricultural commodities									
Manufactured commodities									
Wholesale Trade Services									
Tourism Services									
	$U_{.1}$	$U_{.2}$	$U_{.3}$	$U_{.4}$					

Model for estimating potential VAT and VAT Gap – Consumption approach: The Excel Model estimates the VAT base as shown in equation 6. However, before we apply the formulae, we need to reallocate column vectors to the various industries.

Re-allocating commodity vectors to industries

While Supply and Use are available by commodity as well as industry, the other terms are sometimes only available by commodity, and, consequently, these need to be allocated across industries. In the consumption approach we need to estimate the input tax credits for each sector. This requires the

investment or Gross Fixed Capital Formation vector to be distributed across the various sectors. In order to do so we apply the following assumption,

a) VAT is a column vector by commodity 'c' in the Supply Table are allocated first to the components of the Use Table, Intermediate Use, Final Consumption, Investment and Exports in the ratio of the total Intermediate Use, Final Consumption, Investment (as VAT does not apply to exports we do not allocate VAT to it).

$$V_{cU} = V_c * \frac{\sum_i U_{ci}}{(\sum_i U_{ci} + I_c + FC_c)}$$

$$V_{cI} = V_c * \frac{\sum_i I_c}{(\sum_i U_{ci} + I_c + FC_c)}$$

$$V_{cFC} = V_c * \frac{\sum_i FC_c}{(\sum_i U_{ci} + I_c + FC_c)}$$

eq. (7)

Then the VAT which are allocated to Intermediate Use V_{cU} which is a column vector by commodity is further allocated by industry 'i' in the ratio of the total intermediate use of that commodity by that industry to the total intermediate use of that commodity across all industries.

$$V_{ci} = V_{cU} * \frac{U_{ci}}{\sum_i U_{ci}}$$

eq. (8)

Figure 7: Illustration of VAT vector reallocation

VAT
Commodity
Agricultural commodities
Manufactured commodities
Wholesale Trade Services
Tourism Services

Industry→ Commodity↓	Agri-culture	Manu-facturing	Trade	Hotel	Total Intermediate Use	Final Consumption	Investment (GFC)	Exports
Agricultural commodities	I_{11}	I_{12}	I_{13}	I_{14}			$I_{1.}$	
Manufactured commodities	I_{21}	I_{22}	I_{23}	I_{24}			$I_{2.}$	
Wholesale Trade Services	I_{31}	I_{32}	I_{33}	I_{34}			$I_{3.}$	
Tourism Services	I_{41}	I_{42}	I_{43}	I_{44}			$I_{4.}$	

Industry→ Commodity↓	Agriculture	Manufacturing	Trade	Hotel	V_{cU}	Final Consumption	Investment (GFC)	Exports
Agricultural commodities	I_{11}	I_{12}	I_{13}	I_{14}	$V_{1.}$			
Manufactured commodities	I_{21}	I_{22}	I_{23}	I_{24}	$V_{2.}$			
Wholesale Trade Services	I_{31}	I_{32}	I_{33}	I_{34}	$V_{3.}$			
Tourism Services	I_{41}	I_{42}	I_{43}	I_{44}	$V_{4.}$			

b) Gross Capital Formation net of VAT (as calculated above V_{cI}) by commodity 'c' are allocated to industry 'i' in the ratio of the intermediate use by industry (i) to the total intermediate use across all industries

$$I_{ci} = I_c * \frac{U_{ci}}{\sum_i U_{ci}}$$ *eq. (9)*

Figure 8: Illustration of Investment vector reallocation

Industry→ Commodity↓	Agriculture	Manufacturing	Trade	Hotel			Investment (GCF - V_{cI})		
Agricultural commodities	I_{11}	I_{12}	I_{13}	I_{14}			$I_{1.}$		
Manufactured commodities	I_{21}	I_{22}	I_{23}	I_{24}			$I_{2.}$		
Wholesale Trade Services	I_{31}	I_{32}	I_{33}	I_{34}			$I_{3.}$		
Tourism Services	I_{41}	I_{42}	I_{43}	I_{44}			$I_{4.}$		

Figure 9: Removing embedded VAT from Intermediate Use and final Consumption

Industry→ Commodity ↓	Intermediate Consumption - VAT					Final Consumption - VAT	
	Agriculture	Manufacturing	Trade	Hotel			
Agricultural commodities	$U_{11} - V_{11}$	$U_{12} - V_{12}$	$U_{13} - V_{13}$	$U_{14} - V_{14}$		$FC_{14} - V_{1FC}$	
Manufactured commodities	$U_{21} - V_{21}$	$U_{22} - V_{22}$	$U_{23} - V_{23}$	$U_{24} - V_{24}$		$FC_{24} - V_{2FC}$	
Wholesale Trade Services	$U_{31} - V_{31}$	$U_{32} - V_{32}$	$U_{33} - V_{33}$	$U_{34} - V_{34}$		$FC_{34} - V_{3FC}$	
Tourism Services	$U_{41} - V_{41}$	$U_{42} - V_{42}$	$U_{43} - V_{43}$	$U_{44} - V_{44}$		$FC_{44} - V_{4FC}$	

Estimate the extent of exemptions for each industry: In order to calculate the disallowed input tax credit, we need to calculate the proportion of supplies by each industry that is exempt. For this we need the exemptions under current law for each commodity. For example, 80percent of agriculture commodities may be exempt, 10% of manufactured commodities are exempt, etc.

	Tax Rate τ_c	Percent of Exempt Supplies e_c
Agricultural commodities	τ_1	e_1
Manufactured commodities	τ_2	e_2
Wholesale Trade Services	τ_3	e_3
Tourism Services	τ_4	e_4

The vector of the percent of exempt supply e_c is applied to the Supply matrix to each industry column.

$$[ES]mxn = e_c \otimes [S]mxn \qquad\qquad eq.\ (8)$$

where $\otimes$ is the element wise (Hadamard) multiplication operator applied to each column, i.e. for each industry 'i', for row 1 of the e_c vector is multiplied by row 1 of the 'i'th column of the S matrix.

This gives us a matrix of the exempt supplies. This when added row wise for each industry gives us the exempt supply by industry.

$$Ei = \frac{\Sigma_i ES_{ci}}{\Sigma_i S_{ci}} \qquad\qquad eq.\ (9)$$

The Process to estimate the Potential VAT is as follows:

1. Remove the embedded VAT from the Use Table including Intermediate Use, Final Consumption and Investment (GFC) as shown above.
2. Allocate the Investment (GFC) to the industries as shown above
3. Apply the benchmark/current rates (column vector of commodity rates) to the Final Consumption vector after the Tax is removed (i.e. multiply the entries of the column vectors the tax rate for each commodity with the relevant final consumption of that commodity).

$$[VAT(FC)]c = \tau_c \otimes FCc \qquad\qquad eq.\ (10)$$

where $\otimes$ is the cell wise multiplication operator.

4. Calculate the total inputs for each industry. This is essentially the mxn matrix of purchases net of VAT [P],

$$[P]mxn = [U']mxn + [I]mxn \qquad\qquad eq.\ (11)$$

where $[U']_{mxn}$ - $[V]_{mxn}$

5. Apply the benchmark/current rates to each of the columns of the total input matrix (i.e. apply the column vector of the commodity rates with its use by each industry). This calculates the input tax credit for each commodity by each industry.

$$[ITC]mxn = \tau_c \otimes [P]mxn \qquad\qquad eq.\ (12)$$

6. Add the input tax credit for each industry to get a row vector of total input tax credit by industry.

$$[ITC]i = \sum_i ITC_{ci} \qquad\qquad eq.\ (13)$$

7. Apply the percentage of exempt supply by industry 'i' from equation (9) to the total input tax credit by industry to obtain the ITC disallowed.

$$[ITC-D]mxn = Ei \otimes [ITC]mxn \qquad\qquad eq.\ (14)$$

where $\otimes$ is the element wise multiplication operator now applied to each of the rows.

We are now able to calculate the VAT Potential as per equation (6), using equations (10) and (14), however, $[VAT(FC)]_c$ as shown in equation (10) is a column vector by commodity while $[ITC-D]_i$ in (14) is a row vector of industries.

$[VAT(FC)]_c$ can be allocated to industry in the ratio of the supply of that commodity by each industry from the Use table. i.e.

$$[VAT(FC)]_{ci} = [VAT(FC)]_c * \frac{S_{ci}}{\Sigma_i S_{ci}} \qquad\qquad eq.\ (15)$$

This converts the column vector into an mxn matrix of industry and commodity. From (14) and (15) we obtain the VAT Potential by industry and commodity.

$$[VAT\ Potential]\ mxn = [VAT(FC)]_{mxn} + [ITC\text{-}D]mxn \qquad\qquad eq.\ (16)$$

Summing Equation (16) by each industry gives us the VAT Potential by industry and allows us to calculate the Policy Gap and the Compliance Gap.

Annex II: Mapping of domestic VAT collections to SUT

Table 3: Domestic VAT collections in the West Bank and concordance with SUT

0000-1000	Agriculture	10,803,482	AAA
1100-1110	Meat processing	2,306,547	AAA
1010-1080	Mining and quarrying	11,468,964	BBB
1120-3101	Industry	231,904,874	CCC
4000-4243	Construction	61,551,641	FFF
5000-5699	Wholesale and retail trade	219,947,678	GGG
6000-6430	Transportation	20,630,490	HHH
6701-6500	Services	5,388,015	HHH
7386-7386	Worker transport	7,094,799	HHH
5800-5890	Hotels, convalescence and recreation	4,656,069	III
6600-6600	Travel and tourism agents	1,448,169	III
5701-5790	Restaurants, cafes and food services	5,943,309	III
7370-7370	Tour guides	3,080	III
7330-7332	Telecommunications	195,913,656	JJJ
7000-7206	Financial institutions and cash services	211,720,772	KKK
7210-7215	Real estate services	841,512	LLL
7320-7329	Engineering services	5,507,261	MMM
7300-7300	Legal services	3,664,969	MMM
7310-7320	Accounting and auditing	7,407,413	MMM
9100-9118	Automotive services	5,867,219	NNN
9200-9310	Repair and maintenance	1,168,778	NNN
9400-9404	Beauty salons and centers	679,194	NNN
7334-7335	TV and Photography	228,684	NNN
7301-7303	Interpretation service	31,471	NNN
7333-7333	E-marketing	54,184	NNN
7340-7385	Guarding and cleaning services	7,903,182	NNN
7380-7388	Advertising, marketing, and general services	7,105,016	NNN
9500-9883	Cleaning services	518,357	NNN
7388-7388	Auxiliary services	1,102,162	NNN
8000-8401	Educational and professional institutions	5,930,418	PPP
8500-8703	Medical services	21,128,768	QQQ
9001-9051	Artistic and musical services	1,875,981	RRR
8700-8981	Other services	57,266	SSS
Total NIS		**1,061,853,380**	
Total USD		**296,607,089**	

Table 4: Domestic VAT collections for the West Bank remapped to SUT commodities

		Domestic VAT Allocated to SUT Sectors
AAA	Agriculture, forestry and fishing	3,662
BBB	Mining and quarrying	3,204
CCC	Manufacturing	64,778
DDD	Electricity, gas, steam and air conditioning	-
EEE	Water collection, treatment, supply and sewer	-
FFF	Construction	17,193
GGG	Wholesale and retail trade services	61,438
HHH	Transportation and storage	9,250
III	Accommodation and food services activities	3,366
JJJ	Information and communication	54,724
KKK	Financial and insurance activities	59,140
LLL	Real estate activities	235
MMM	Professional, scientific and technical activities	4,631
NNN	Administrative and support service activities	6,888
OOO	Public administration and defense; compulsory	-
PPP	Education	1,657
QQQ	Human health	5,902
RRR	Arts, entertainment and recreation	524
SSS	Other service activities	16
TTT	Activities of households as employers	-
UUU	Extra-territorial organizations	-
XMC	Territorial correction	-
	Total	296,607

Annex III: Effective VAT rates for SUT commodities

Table 5: Estimates and assumptions for effective tax rates per SUT commodities

		Benchmark Rate	Exemption	Zero-rated	Effective Rate
AAA	Agriculture, forestry and fishing[1]	17%	17%	0%	14.1%
BBB	Mining and quarrying	17%	0%	0%	17.0%
CCC	Manufacturing	17%	0%	0%	17.0%
DDD	Electricity, gas, steam and air conditioning	17%	0%	0%	17.0%
EEE	Water collection, treatment, supply and sewer	17%	0%	0%	17.0%
FFF	Construction	17%	0%	0%	17.0%
GGG	Wholesale and retail trade services	17%	0%	0%	17.0%
HHH	Transportation and storage	17%	0%	0%	17.0%
III	Accommodation and food services activities[2]	17%	50%	0%	8.5%
JJJ	Information and communication	17%	0%	0%	17.0%
KKK	Financial and insurance activities[3]	17%	100%	0%	0.0%
LLL	Real estate activities	17%	100%	0%	0.0%
MMM	Professional, scientific and technical activit.	17%	0%	0%	17.0%
NNN	Administrative and support service activities	17%	0%	0%	17.0%
OOO	Public administration and defense; compulsory[4]	17%	100%	0%	0.0%
PPP	Education[5]	17%	40%	0%	10.2%
QQQ	Human health[6]	17%	66%	0%	5.7%
RRR	Arts, entertainment and recreation	17%	0%	0%	17.0%
SSS	Other service activities	17%	0%	0%	17.0%
TTT	Activities of households as employers	17%	0%	0%	17.0%
UUU	Extra-territorial organizations	17%	0%	0%	17.0%
XMC	Territorial correction	17%	0%	0%	17.0%

Notes:

1 Effective Rate Calculated for Exempt Fruits and Vegetables. Data on proportion of Fruit and Vegetables to total Agriculture and Forestry Commodities taken from Household Survey

2 Exemption applies to hotels catering to tourists. It is assumed that 50% of the hotel cater to tourism.

3 Financial Services relating to lending are exempt under the law

4 Public Administration taken as an providing only exempt supplies. This as a sector is also taken as exempt as government does not file VAT returns

5 Education provided by government is treated as exempt. This ratio is obtained from government consumption of education services to total education services supplies by the economy

6 Health provided by government is treated as exempt. This ratio is obtained from government consumption of health services to total health services supplies by the economy

Annex IV: Adjustments for import VAT from clearance revenues

Table 6: Breakdown of actual VAT collections between territories

	Actual (2019)			SUT (2019)		
	Palestine	WB[8]	Gaza[8]	WB[9]	Gaza	WB/Palestine%
Clearance Revenues						
Customs	1,031	992	39	1,127	44	96.2%
Value Added Tax	600	545	55	1,250	126	90.8%
Purchase Tax	-4					
Petroleum Excise	735					
Domestic Revenues						
Customs	186	179	7			
Value Added Tax	297	297	-			
Excise on beverage	1					
Excise on tobacco	62					

Total Value Added Tax		842	55
Wrongly Classified as VAT[10]		409	
VAT as percentage of Total in SUT		67.3%	
Import VAT as percentage of Total in SUT		43.6%	

Table 7: Import VAT collections in accordance with SUT commodities

		Domestic VAT Allocated to SUT Sectors	Import VAT Allocated to SUT Sectors	Total VAT Collection by Sector
AAA	Agriculture, forestry and fishing	3,662	49,637	53,299
BBB	Mining and quarrying	3,204	1,292	4,496
CCC	Manufacturing	64,778	92,035	156,813
DDD	Electricity, gas, steam and air conditioning	-	106,955	106,955
EEE	Water collection, treatment, supply and sewer	-	196	196
FFF	Construction	17,193	133,811	151,004
GGG	Wholesale and retail trade services	61,438	17,308	78,746
HHH	Transportation and storage	9,250	17,786	27,036
III	Accommodation and food services activities	3,366	32,119	35,485
JJJ	Information and communication	54,724	2,639	57,364
KKK	Financial and insurance activities	59,140	2,028	61,168
LLL	Real estate activities	235	125	360
MMM	Professional, scientific and technical activi	4,631	3,738	8,369
NNN	Administrative and support service activities	6,888	5,293	12,181
OOO	Public administration and defense; compulsory	-	21,786	21,786
PPP	Education	1,657	1,780	3,436
QQQ	Human health	5,902	42,979	48,881
RRR	Arts, entertainment and recreation	524	411	935
SSS	Other service activities	16	13,355	13,371
TTT	Activities of households as employers	-	-	-
UUU	Extra-territorial organizations	-	-	-
XMC	Territorial correction	-	-	-
	Total	296,607	545,274	841,881