Macro-Economic and Welfare Effects of VAT in GCC countries: General Equilibrium Analysis
Disna Sajeewani and Xianming Meng

Abstract
In this study, an attempt has taken to empirically investigate the potential macroeconomic and welfare effects of the introduction of Value Added Tax (VAT) in Gulf Corporation Council (GCC) countries. It is expected that most of the countries in the Council are to introduce VAT in January 2018. The current legislated VAT policy provides a set of guidelines, rules and industry coverage. The ultimate goal of introducing a Tax Policy is to ensure that Taxation provides an alternative revenue source for these governments, whilst to face challenges of widening fiscal deficits. Such a tax system is also expected to introduce indirect taxation mechanism to these economies. Accordingly, GCC countries have agreed to introduce 5% VAT on selected goods and services. Considering, an alternative to the selected VAT, this study attempts to quantify macroeconomic and welfare effects of selected VAT policy and compare with a general VAT policy where all possible sectors are taxed. Using a GTAP-E we simulate 5% VAT under both policies assuming all GCC member countries will implement VAT at the same time. Study finds that the introducing VAT raises the government revenue, without significantly affecting the growth. Furthermore, it is found that general VAT is comparatively welfare efficient than the selected VAT.

1. Introduction
Gulf Corporation Council (GCC) was established in 1981 which constitute Bahrain, Kuwait, Omar, Qatar, Saudi Arabia and the United Arab Emirates (UAE) with the aim of strengthening economic and social interactions between member countries. In the early 1990, partially as advised by the International Monetary Fund (IMF), the GCC member states reportedly studied the feasibility of introducing Value Added Tax (VAT) system in the GCC. IMF (2015) mentioned that GCC states should no longer rely on oil revenues as the major source of government revenue and recommended

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to cut government spending and find alternative revenue sources such as income tax, corporate
tax, and consumption tax type VAT. In February 21 2017, the managing director of the IMF, Christine
Lagarde, said that ‘Residents in the Gulf region must ‘get used’ to taxation if they expect continued
public investment particularly in large-scale public infrastructure plans’. (Thompson Reuters, 2017).
According to the current consensus among GCC economies, plans are underway to implement
GCCUVAT (GCC Unified VAT Agreement) regime in 2018 by 1 January 2018. Implementing a
unified system is important by all GCC countries, in order to avoid any distortions arising from intra-
GCC trade. For instance, unified system will prevent consumers searching for goods that are VAT
free from neighbouring GCC countries.

VAT has been a popular fiscal tool in many economies around the world as a stable source of
government revenue because it allows more efficient resource allocation compared to other taxes like
income taxes and corporate taxes (Go, et. al. 2005; Baye and Jansen, 2006). Theoretically, efficiency
of VAT comes as a result of encouraging the inter-temporal consumption decisions, i.e., a
consumption type VAT does not distort people deciding how much to work (after-tax compensation)
and deciding how much to save (after-tax rate of return). Thus, increasing savings and real output per
person in the long run (Gravell, 2002; Garner, 2005). Further, as the cost of VAT falls onto the
consumer rather than the producer, VAT is considered to be rather a neat way of meeting government
revenue, without distorting investment decisions of businesses (Deloitte, 2015). According to the
OECD data, the VAT is taking increasingly larger share of the total tax revenue earned in member
countries. Currently 160 countries have implemented VAT regimes (Schenk and Oldman 2007).

Generally, VAT is imposed on every business transaction, with a rebate for intermediate and
investment purchases. Since goods and services are produced in stages, only the value addition in
each stage will be taxed from the final buyer (Saeed et al., 2012; Keen and Lockwood, 2009). As
such, unlike other indirect taxes, VAT eliminates cascading effects of taxes on intermediate inputs
and removes distortions affecting input choices (Go, et al. 2005; Ebril, et al 2001). Another common
feature of VAT is that exports are exempted or zero rated. Because of this, VAT is regarded as neutral
towards international trade and does not affect the competitiveness of domestic firms to export
(Feldstein and Krugman, 1990; Muir, 1993; Charlet and Owens, 2010). In practice, countries that use
VAT systems have adopted single rate or multiple rate VATs with various exemptions and exceptions
to the goods and services. There are number of exemptions adopted due to “technical” reasons under
the European style VAT or so called traditional VAT. For instance, financial services, insurance
services, gambling services, certain types of immovable property transactions and government
services are VAT exempt. However, the Modern VAT which was introduced by the New Zealand
government (called VAT/GST), has broaden the VAT base and included many of such exempted
entities under the VAT. Other exceptions to the VAT are mainly due to equity concerns. Since the
ultimate burden on VAT is the final consumer, certain basic consumption items (such as certain foods,
medicines, and education and healthcare services) are considered to except (zero rate) or apply
reduced rates. Thus, the majority of VAT regimes are characterised by multiple rates and multiple
exemptions (Giesecke and Nhi (2010); Ebrill et al. (2001). However, with regard to economic
efficiency and administrative costs, multiple VAT rates are likely to increase complexity and the
administrative and compliance costs (Bye et al. 2003; Charlet and Owens, 2010).

Evaluating and quantifying the macroeconomic, sectoral and distributional effects of VAT policy can
be performed using various economic models, like partial equilibrium models or computable general
equilibrium (CGE) models. Use of partial equilibrium models have a limited scope in VAT policy
analysis, because VAT effects are not limited to one market but are economy wide. Unlike partial
equilibrium models, CGE models consider entire economy by taking all markets and their
interactions. This way CGE models describe the behaviour of economic agents (e.g. producers,
consumers, governments and the rest of the world) operating in markets at equilibrium. The use of CGE models has become very important tool since the beginning of 1980s, where most of the taxation reforms (direct or indirect) are analysed using CGE models (Kehoe, et. al. 1988; Shoven and Whalley, 1992; Greenaway, et al., 1993).

This study uses a computable general equilibrium model, GTAP-E (Global Trade Analysis Project) model (Hertal, 1997) which is a comparative static global general equilibrium modelto quantify the macroeconomic and sectoral impacts of introducing a single rate VAT on the GCC countries. At present direct and indirect tax revenue of these countries are very small and narrow based (IMF, 2012). Mostly GCC countries relies heavily on indirect taxes – goods services and custom duties where indirect taxation is uncomplicated and account less than 5% of the gross domestic product (Almutairi, 2014). According to the various reports and websites (eg. MOF UAE, 2017; PWC, 2017; KPMG, 2017), the VAT proposal for the GCC countries will charge 5% VAT on most goods including vehicles, clothing, business consumables sectors and imports. Basic food items, essential medicines, exports and international services will be zero rated and healthcare, education services, financial services, insurance, sale and lease of residential property and domestic public transportation will be exempted.

This paper is organized as follows. Section 2 provides a review of literature related to the analysis of general equilibrium effects of VAT regimes. Section 3 presents methodology, data and calibration procedures. In section 4 we present macroeconomic and welfare effects of the simulation scenarios. Finally in section 5 we present concluding remarks of this study.

2. Literature Review

Since the development of Johansen’s Multi-sectoral Growth (MSG) model (1960), the use of CGE models has become very popularanalytical tool (see for example, Dixon et al., 1982; Powell and Lawson, 1990; Vincent, 1990) to investigate a variety of policy issues, including tax policies, development issues, agricultural programs, international trade, energy and environmental policies etc. Basically, CGE models are useful whenever there are large numbers of production sectors and households, or when there are distortions in the economy, such as government intervention. Shoven and Whalley (1972,1973) pioneered the use of general equilibrium model to analyse tax distortions in the economy. Wing (2004) discusses, how the consumption tax changes the intermediate and primary factor demand in the taxed and non-taxed sectors. For instance, a consumption type VAT does not cover the entire economy and CGE models are required to gauge the economy wide effects (Devarajan and Robinson, 2002). Accordingly, a CGE model can be used to explain the interactions between various industries, households and other institutions and between both the supply and demand sides. Therefore, a CGE model is capable of simulating impacts with respect to the economy as a whole as well as to a particular sector. The focus of this section is to include a review of CGE models used in value added tax policies to analyse impacts in various aspects, such as macro-economic, sectoral and distributional effects, tax incidence and welfare effects, competitiveness, and revenue gain.

VAT is a consumption type tax, which is often regarded as an efficient way of raising the government revenue, given the broad VAT base is applied covering all goods and services. Further, when comparing the effectiveness of each tax instrument as a source of government revenue, VAT is found to be more effective because of its wider coverage in the economy. However, from the distributional perspective, broadened VAT base found to be regressive because low income households tend to consume larger fraction of their income on basic commodities, which will be under VAT. As such measures have to be taken in order to reduce tax burden on the poor, or to make it more progressive by applying different VAT rates or exemptions. By doing so, rather efficient tool of generating public
funds can become highly inefficient, due to rent seeking behaviour of various agents and increase in administrative and compliance costs. Therefore, various studies have undertaken to evaluate efficiency and equity aspects of introducing optimal VAT in various economies.

Studies that have broadly used to investigate macroeconomic and sectoral implication of VAT find simplified VAT systems brings more welfare gains to economies. For instance, Giesecke and Nhi (2010) analyse the macroeconomic, industrial and distributional effects of a simplified single rate VAT system and showed how VAT simplification advances Vietnam’s development goals. In their study a dynamic CGE model is used to evaluate the overly complex VAT system in Vietnam which has three rates and large number of exemptions, and find single rate VAT with no exemptions to VAT system contribute to one third of welfare gain, largely via a reduction in the rate of indirect taxation on capital accumulation. An illustrative estimate shows a fall in compliance and administrative costs in this regard. However, still researchers suggest to exclude paddy and rice from VAT in order to reduce adverse distributional effects to the aggregate welfare gain.

Levin and Sayeed (2014) employs a CGE model to evaluate whether a uniform VAT or VAT with exemptions is preferable from the distributional perspective in Bangladesh economy. They find when the VAT base is broadened, the tax incidence is higher for the poor households. Basically, when VAT is imposed only on food, they find poor households spend a higher share on their income on food. However, mere exemptions on food does not improve welfare of the poor, as food would provide implicit subsidy and transfer funds to the high income groups. When simulations are carried out exempting local market food sectors, equivalent variations of the low income groups both at rural and urban become better off. Thus, from the equity and distributional perspective, researchers suggest reforms to VAT system with exemptions on local food sectors.

Boeters, et al. (2006) employ an applied general equilibrium model to investigate efficiency and distributional impacts of replacing the differentiated VAT (standard, reduced rate and zero rate) with a uniform VAT. They find significant gains in overall welfare when the revenue increase from the VAT is used for uniform adjustments to income taxes or social security contributions. Similarly, Devarajan and Panagariya (2000) find, efficiency losses when commodities are left out of the tax base. Mainly, VAT differentiation acts as a subsidy to the lobbying interests of the respective final-goods producers and their intermediate input suppliers and benefits are not passed onto the consumers as intended.

Ballard et al. (1987) evaluate efficiency and incidence effects of consumption type taxes; flat consumption type VAT (6.52%), VAT with a European style rate structure (0% to 15%) and direct progressive expenditure tax (0.3% to 11.6%) using a general equilibrium model of the U.S. economy. They find while both types VATs produce regressive distribution of welfare, flat-VAT improves aggregate welfare when the increase in revenue is used to reduce personal or corporate income taxes. In contrast, Devarajan and Hossain (1998) finds general equilibrium effects of VAT incidences are broadly neutral in Philippines, because expenditure on health, education and infrastructure are progressive and more importantly, rich consumes more energy intensive goods.

Sajadifar, et al. (2012) employed a CGE model to investigate the impact of 3, 4 and 10 percent value added tax rates on the Iran economy. In the simulation, exports, basic food items, essential medicines, services that are subjected to income taxes and other financial, educational, transportation services have been excluded. Findings suggest even though government revenue increases under all scenarios, the negative impact on household welfare is still significant. Because VAT causes the gross domestic product to decline, the government should be cautious when increasing VAT rates especially during a period of a recession.
The focus of some studies is to identify alternative set of policies to reduce adverse distributional impact arising from VAT policies. In this light, Go, et al. (2005) analyse the trade-off between VAT and other alternative tax adjustments in South Africa tax system by employing a CGE model. They find when VAT is replaced with proportional increase in direct income tax improves welfare gain for low and middle income households (those in the first six decile, while rich-income households face a welfare loss. However, when VAT is replaced with the commodity taxes, both high income and low income households face welfare losses which offsets the gains from setting VAT to zero. Similarly Hossian (1995) investigate the income distributional impact of alternative policy package (VAT with exemptions and excise taxes for certain commodity groups) and conclude that the welfare consequences of alternative packages are superior to those of the uniform VAT. As a poverty alleviating strategy in South Africa, Kearney and Heerden (2004) use a CGE model to investigate alternative means of compensating loss in government revenue from zero rating VAT on food, and conclude that zero rating on food lowers regressivity of VAT if it is combined with proportional increase in direct taxes.

CGE models has been used to explore long-run effects, where all production factors are variable and inter-sectorally mobile (see for example, Serra-Puche, 1984; Ballard et al., 1985; Feher et al., 1993; Van der Mensbrugghe, 1994). By considering how time horizon impact on VAT, Emini (2000) assess the short-run and long-run effects of VAT in Cameroon using a CGE model. Study finds strong evidence to explain why pure VAT (uniform VAT broadened to all sectors) is welfare improving in the long-run as compared to imperfect VAT (with different rates) even though the short-run effects are not so much favourable under a pure VAT. So basically, imperfect VAT provides short-run relief for the people, and may be politically appealing, however, the reallocation of resources induced by the pure-VAT brings sustainable welfare improvement in the economy.

Bye et al. (2003) analyse economic efficiency of Norwegian tax reforms employing an intertemporal disaggregated numerical general equilibrium model. Results indicate positive long-run welfare effects of general VAT (uniform VAT including all goods and services). The intertemporal efficiency of the general VAT mainly arise due to reallocation of savings from financial to real capital and partly due to abolition of the investment tax credit and the VAT on investment goods. In contrast, the political VAT reform, which is characterised by low VAT rate on food and non-alcoholic beverages, has a negative effect on the utility of material consumption which implies reallocation of resources from a low-taxed activity to a high taxed activity; thus contributes to reduce the welfare.

3. Methodology, Data and Calibration

The CGE model used in this study is known as the Global Trade Analysis Project (GTAP-E) developed by Burniaux and Truong (2002), which is an extension of the standard GTAP model. The GTAP-E model incorporate capital-energy substitution into the standard GTAP model. Mainly, the use of GTAP-E model can be found in energy policies, environmental policies (see for example, Nijkamp et al., 2005; Peterson and Schleich, 2007; Truong, et al., 2007; Kemfert et al., 2006; Tommasino and Martini, 2010; Niemi and Honkatukia, 2011). The GTAP-E model is a comparative static multi-sectoral, multi-regional computable general equilibrium model of the world economy. The model is solved in GEMPACK software using the global database Version 9.1 with the long-run closure assumption.

Scenario 1: Selected VAT: A value added tax will be imposed on goods and services exempting following listed goods and services. This simulation is in accordance with the current proposal of VAT in GCC.
• Exports
• Basic, essential food items
• The oil sector and the oil and gas derivatives sector
• Supply of precious metal for investment (gold, silver and platinum).
• Financial services, education, healthcare, public transport and newly constructed residential properties.

Scenario 2: General VAT: A value added tax will be imposed on all goods and services in the economy, on both domestic and imported consumption. Exports, intermediate goods, investment goods, financial services, insurance services, residential properties will be zero rated. (These sectors are commonly excluded in any VAT).

We simulate 5% VAT under both scenario 1 and 2. Following the current VAT proposal of the GCC countries, it is highly likely that 3-5% VAT similar to scenario 1 will be implemented from 1 January 2018. Therefore, we discuss macroeconomic and welfare effects of 5% VAT under selected plan and compare the effects under the general 5% VAT. The objective of comparing these two scenarios is to identify the effectiveness of VAT that can be measured by looking at the ability of the tax to raise revenue and the fairness of the tax (Ebrill, et. al.). The GTAP-E model is mainly designed for simulating energy and environmental policies but the main features of the GTAP model are preserved with the latest database, 9.1 version. Thus, we use GTAP-E model with some modifications to implement the VAT policies in GCC country block. There are 57 sectors in the database. For the purpose of this study we aggregate these sectors into 23 sectors in order to implement VAT policies on the GCC countries.

4. Simulation Discussion

Once we shock the model with the VAT scenario, the CGE model recalculates the new equilibrium status of the economy, thus values shown after shock are presented as percentage changes compared with the baseline case. The sensitivity tests are also carried out to check for sensitivity to parameter specification and the simulation, and the results are reasonably insensitive to the specification of these parameters. The effects of VAT on the changes in the important macroeconomic variables are observed first.

Table 1 and 2 shows the percentage changes in real GDP, real domestic consumption, real investment, real exports and real imports to selected and general VAT scenarios. The last columns show the government revenue collected in $US million. The VAT impact on the real GDP in all GCC countries are negative but very small. The selected and general VAT cause real GDP to decrease slightly ranging from -0.01 to -0.03 percent in all countries. Unlike in many other economies, these countries are characterised as tax heaven economies. Thus, with the absence of current distortions, the small increase in VAT may not cause significant impact on the economy in the long-run. Next, we look into domestic final demand; real domestic consumption and real investment. Quite contrary to the widely held view that VAT is mainly impact on domestic consumption, it is seen that negative impact on the real investment is higher than the real domestic consumption under all scenarios of VAT. The real domestic consumption under the selected VAT register negative percentage changes for all GCC countries, but the magnitude of the changes are slightly different. Further, the real domestic consumption under the selected VAT register negative percentage changes for all GCC countries.
countries whereas under the general VAT registers positive changes in Kuwait, Oman and Saudi Arabia. Thus, the impact on domestic final demand under the general VAT is smaller than under the selected VAT scenario.

When the VAT effects on international trade is considered, it reveals interesting finding. As seen the selected VAT reduces real exports only in Bahrain (-0.15%) while all other countries real exports increases. This is due mainly to the fact that exports are exempted from the VAT. Impact on the real imports are mixed. For instance, selected VAT decreases real imports in Bahrain, Kuwait, Oman and UAE while real imports increases in Qatar and Saudi Arabia. Both real exports and real imports are decreasing under the general VAT policy in all countries. Thus, the selected VAT favours the international competitiveness that will bring about from the VAT policy.

We implement that all VAT revenues are initially collected by the government ($US million). As seen the selected VAT generates revenues for GCC countries with different magnitude, depending on their size of the economies. Government revenue increases with the selected VAT. However, when the general VAT is considered, the increase in government revenue is significantly higher than under the selected VAT.

Table 1: Macroeconomic effects of 5% Selected VAT (percentage change)

<table>
<thead>
<tr>
<th></th>
<th>Real GDP</th>
<th>Domestic real consumption</th>
<th>Real investment</th>
<th>Real exports</th>
<th>Real imports</th>
<th>VAT revenue ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>-0.02</td>
<td>-0.32</td>
<td>-1.15</td>
<td>-0.15</td>
<td>-0.63</td>
<td>360.34</td>
</tr>
<tr>
<td>Kuwait</td>
<td>-0.01</td>
<td>-0.84</td>
<td>-1.66</td>
<td>0.27</td>
<td>-0.19</td>
<td>1150.12</td>
</tr>
<tr>
<td>Oman</td>
<td>-0.01</td>
<td>-0.52</td>
<td>-0.79</td>
<td>0.1</td>
<td>-0.27</td>
<td>543.47</td>
</tr>
<tr>
<td>Qatar</td>
<td>-0.01</td>
<td>-0.86</td>
<td>-0.93</td>
<td>0.94</td>
<td>1.98</td>
<td>2933.78</td>
</tr>
<tr>
<td>Saudi</td>
<td>-0.01</td>
<td>-0.6</td>
<td>-0.97</td>
<td>0.6</td>
<td>0.53</td>
<td>6938.76</td>
</tr>
<tr>
<td>UAE</td>
<td>-0.02</td>
<td>-0.22</td>
<td>-0.6</td>
<td>0.38</td>
<td>-0.05</td>
<td>5343.9</td>
</tr>
</tbody>
</table>

Source: GRAP-E Simulations

Table 2: Macroeconomic effects of 5% General VAT (percentage change)

<table>
<thead>
<tr>
<th></th>
<th>Real GDP</th>
<th>Domestic real consumption</th>
<th>Real investment</th>
<th>Real exports</th>
<th>Real imports</th>
<th>VAT revenue ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>-0.03</td>
<td>-0.07</td>
<td>-0.47</td>
<td>-0.35</td>
<td>-0.45</td>
<td>908.74</td>
</tr>
<tr>
<td>Kuwait</td>
<td>-0.01</td>
<td>0.17</td>
<td>-0.18</td>
<td>-0.16</td>
<td>-0.09</td>
<td>5758.27</td>
</tr>
<tr>
<td>Oman</td>
<td>0</td>
<td>0.03</td>
<td>-0.03</td>
<td>-0.1</td>
<td>-0.09</td>
<td>2526.67</td>
</tr>
<tr>
<td>Qatar</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.1</td>
<td>-0.16</td>
<td>-0.47</td>
<td>5884.58</td>
</tr>
<tr>
<td>Saudi</td>
<td>-0.01</td>
<td>0</td>
<td>-0.03</td>
<td>-0.11</td>
<td>-0.07</td>
<td>22436.45</td>
</tr>
<tr>
<td>UAE</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.19</td>
<td>-0.25</td>
<td>-0.22</td>
<td>11191.56</td>
</tr>
</tbody>
</table>

Source: GRAP-E Simulations

Further insights of this different VAT policies can be found by examining the equivalent variation (EV). The EV measures the aggregate changes in monetary value, excluding the changes in price level in each region. First, look at EV under the selected VAT scenario. As seen, EV decreases in all countries, but in different magnitudes. The reduction in EV does not correlate with the increase in the government revenue that these countries generate. For example, Kuwait’s loss in EV is higher than the government revenue gain under the selected VAT. Among other remaining five countries, the UAE’s loss in EV is comparatively lowest relative to the government revenue gain. Second, we look at EV under the general scenario. Under the general VAT, EV losses of these countries are
significantly lower or even positive (welfare gaining). Interestingly, EV in Kuwait, Oman and Saudi increases by $245, 18 and 16 million respectively with the 5% general VAT.

Next, we decompose EV or aggregate welfare effects to its component parts; allocative effect, investment savings effect, endowment effect and terms and trade effect. (Mary E. Burfisher (2017):

- Allocative effect – the excess burden from tax
- Investment –savings effects due to changes in prices of domestically produced capital investment goods relative to its world prices (fob) of imported goods and services.
- Endowment effect – due to changes in quantities of factors of production, which change the economy’s productive capacity.
- Terms of trade effect – due to changes in economies world prices (fob) of exported goods and services of its relative imported goods and services.

Table 3 and 4 shows the decomposed components of EV under both VAT policy scenarios. The allocative effect of EV is found to be the least welfare decreasing for most countries implying that the excess burden from tax burden is less prominent than other factors. With regard to the selected VAT, much of the negative impacts are realized due to the terms of trade and investment-savings effect. Because the government budget is balanced, the investment and net exports decrease to counter balance the increase in household consumption of the exempted goods. However, negative impacts are varied among individual countries. For instance, while the negative impact on terms of trade component clearly dominates for Bahrain and UAE, investment-saving effect dominates for Kuwait, Oman, Qatar and Saudi. This is mainly due to the production and international trade composition of those countries have. Interestingly, UAE experiences positive gain from the investment-savings effect which actually reduces the net negative welfare effect of the VAT. In the second simulation, in which all goods and services are taxed, the household consumption reduces in all goods and services. Thus, given the balanced budget, the investment-savings and the terms of trade effect counter balance the domestic consumption. As such, the general VAT policy raises either investment-savings effect or the terms of trade effect of the welfare in these countries. Thus, the net negative welfare arising from this policy is much lower than under the selected VAT policy. The endowment effect is negative under all scenarios, mainly because the VAT changes the demand for economies factors of production and the economy’s productive capacity.

Table 3: Decomposing welfare effects of VAT 5% Selected VAT (US $ million)

<table>
<thead>
<tr>
<th>Country</th>
<th>EV</th>
<th>Allocative effect</th>
<th>Investment saving effect</th>
<th>Endowment effect</th>
<th>Terms of trade effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>-81.84</td>
<td>-5.2</td>
<td>-10.16</td>
<td>-8.42</td>
<td>-66.48</td>
</tr>
<tr>
<td>Kuwait</td>
<td>-1181.76</td>
<td>-21.61</td>
<td>-796.1</td>
<td>-32.54</td>
<td>-364.05</td>
</tr>
<tr>
<td>Oman</td>
<td>-314.2</td>
<td>-5.08</td>
<td>-202.69</td>
<td>-11.71</td>
<td>-106.44</td>
</tr>
<tr>
<td>Qatar</td>
<td>-1306.58</td>
<td>-15.4</td>
<td>-900.67</td>
<td>-47.98</td>
<td>-390.51</td>
</tr>
<tr>
<td>Saudi</td>
<td>-3450.32</td>
<td>-72.29</td>
<td>-2118.71</td>
<td>-156.76</td>
<td>-1259.32</td>
</tr>
<tr>
<td>UAE</td>
<td>-688.68</td>
<td>-67.93</td>
<td>129.64</td>
<td>-102.58</td>
<td>-750.39</td>
</tr>
</tbody>
</table>

Source: GRAP-E Simulations
5. Conclusion

GCC countries are characterised as tax haven economies and excessively depend on oil and gas resources to balance their budgets. However, due to prolonged reduction in oil prices, most of these economies are facing widening budget deficits and the IMF has recommended to find alternative sources of government revenue, such as VAT. Any form of intervention has implications for economic variables, such as output, consumption, investment, net exports and the welfare. In this paper, the CGE model was used to analyse the impact of implementing 5% VAT (selected scenario) on all GCC economies. In order to get a better overview of this tax reform, with regard to welfare impacts, we also introduce 5% general VAT scenario. From the analysis it is clear that the 5% VAT will increase the government revenues of all GCC countries in different magnitudes. When the general VAT is considered, the increase in government revenue is significantly higher than under the selected VAT. Furthermore, the selected and general 5% VAT cause real GDP to decrease slightly ranging from -0.01 to -0.03 percent in all countries. In conclusion, 5% VAT will not cause significant impact on these economies, but when considering the welfare impacts, study finds that general VAT policy is much favourable than the selected VAT policy.

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## Appendix

### A1: GTAP-E aggregated sectors

<table>
<thead>
<tr>
<th>Aggregate sector names</th>
<th>Mapped GTAP 57 sectors</th>
<th>Selected VAT</th>
<th>General VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GrainsCrops</td>
<td>pdr, wht, gro, v_f, osd, c_b, pfb, ocr, pcr</td>
<td>0%</td>
<td>5%, 10%</td>
</tr>
<tr>
<td>2 MealtLstk</td>
<td>ctl, oap, rmk, wol, cmt, omt</td>
<td>0%</td>
<td>5%, 10%</td>
</tr>
<tr>
<td>3 Coal</td>
<td>coa</td>
<td>0%</td>
<td>5%, 10%</td>
</tr>
<tr>
<td>4 Oil</td>
<td>oil</td>
<td>0%</td>
<td>5%, 10%</td>
</tr>
<tr>
<td>5 Gas</td>
<td>gas</td>
<td>0%</td>
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