

DEPARTMENT OF ECONOMICS
OxCarre (Oxford Centre for the Analysis of
Resource Rich Economies)

Manor Road Building, Manor Road, Oxford OX1 3UQ
Tel: +44(0)1865 281281 Fax: +44(0)1865 281163
reception@economics.ox.ac.uk www.economics.ox.ac.uk



OxCarre Research Paper 95

Government Spending, Subsidies and Economic Efficiency in the GCC

Raphael Espinoza*
IMF, Washington DC

***OxCarre External Research Associate**

Government Spending, Subsidies and Economic Efficiency in the GCC

Raphael Espinoza¹

July 2012

Abstract

Public investment and subsidies are typically inefficient but in the GCC these are crucial engines of growth. Subsidies are also used to redistribute oil windfalls in the region, and the problem of a government that wants to ‘distribute’ oil money is a problem fully symmetric to the one analyzed by Ramsey (1927) of optimal taxation. The second-best policy (when lump-sum transfers are not available) is to use subsidies across a wide range of goods (as opposed to the focus on energy chosen by the GCC). In addition, the ‘inverse’ Ramsey model implies that commodities for which demand is least elastic to prices should be subsidized at higher rates. This suggests subsidizing basic needs at higher rates, in particular food, healthcare and education. In addition, when subsidies are very large, they create additional distortions because households prefer to queue for subsidies (e.g. public service jobs, subsidized mortgages in Saudi Arabia) rather than participate in private markets. As an example, we draw a model where recruitment of public servants can induce a large disincentive to take private sector positions and compute the conditions under which the disincentive is so strong that overall employment is actually decreased as public servants are being hired.

JEL: Q32; Q38; O53

Keywords: Gulf Cooperation Council; Middle East and North Africa; Resource Curse

¹ International Monetary Fund, Research Department, 700 19th Street NW, Washington DC 20431, and University of Oxford, Oxford Centre for the Analysis of Resource-Rich Economies
email: respinoza@imf.org

I am grateful to Ghada Fayad, Ananthakrishnan Prasad and Tobias Rasmussen for their very useful comments and suggestions. The views expressed in this paper are those of the author and do not necessarily represent those of the IMF or IMF policy.

1. Introduction

The activities of the government have a heightened importance in the Gulf countries because oil revenues accrue to the government and the way they are spent or saved affects the whole economy. Parts of the receipts from oil exports are saved in sovereign wealth funds or central bank reserves, and the remainder is spent, and therefore channeled to the economy via a large public sector wage bill, via public infrastructure, subsidies for industries, and subsidies and provision of services for the nationals. The diversification process has also required large amounts of government money as structural and development policies remained based on government intervention. Thus, the overall bill for the public sector is high, between 36 percent and 74 of the economy (excluding the oil sector) and above what is common for either emerging or advanced economies.

The nature of expenditure is also quite different. In the United Kingdom, social protection (pensions, welfare benefits) contributes to one third of total spending, and healthcare and education spending account each for around 15 percent of spending. In contrast, Saudi Arabia and the U.A.E. are investing massively in education (more than 25 percent of government spending, see Figure 1). Spending on economic affairs (mostly support to the business sector, but *excluding implicit subsidies*, which are not measured in fiscal accounts) is also large, especially in Bahrain, Kuwait and Qatar where it takes more than 20 percent of the budget. Such numbers witness the considerable interest that the Gulf governments have in pushing for private sector development and diversification. On the other hand, spending on health and pensions in the Gulf remains under check as the national population – which is the one that benefits from welfare spending - is young. Social safety nets are also underdeveloped in countries where unemployment has historically been low though unemployment benefits have recently been introduced in Oman and Saudi Arabia. In a region where neighbors are affected by wars and political instability, military spending is also higher in proportion of the budget than in most advanced countries. Oman and Saudi Arabia spend more than 25 percent of their budget on the army.

Government spending serves several objectives. The first one is to develop the private sector, diversify the economy away from oil, and create jobs. A large share of spending supports

energy-intensive industries, real estate developments, infrastructure and tourism (the economic affairs outlay, in Figure 1). A natural question to ask is whether the strategy is efficient in economic terms. Espinoza (2012) shows that the increase in income per capita was below what could have been expected given the massive accumulation of capital. This result points at possible inefficiencies in the strategy, and the literature has indeed argued that large governments and price distortions created by subsidies reduce growth. We review these arguments in section 2 and discuss how they apply to the GCC.

The second purpose of government expenditure is to distribute a large part of oil revenues to the population, in a way that is compatible with the diversification objective. Government spending benefits directly nationals, through high public service wages, public investment that feeds contractors and sub-contractors, and the improved provision of public goods (infrastructure in particular). Section 3 describes the problem of a government that wants to distribute oil money as an ‘inverse’ Ramsey (1927) problem of optimal taxation/subsidies. The second-best policy (when lump-sum transfers are not available) is to use subsidies across a wide range of goods (as opposed to the focus on energy chosen by the GCC). Section 4 discusses the additional distortions coming from agents’ incentives to queue for subsidies as opposed to participate in private markets. A model of the labor market is given as an example where high wages and employment in the public sector reduce private and total employment. Section 5 concludes.

2. Government spending and the GCC development strategy

A. Public Investment

Capital-intensive economies are more productive and achieve higher levels of income, a result that justifies the use of public investment for the aim of diversification. Nevertheless, sound investment decisions should be taken depending on the rates of returns of those investments. From a microeconomic perspective, if rates of return for domestic investment are lower than the rates of returns that can be achieved by investing in foreign assets, investing domestically is inefficient.

Macroeconomists take a wider approach by looking at the long-term effects of investment on growth and the growth accounting exercise performed in Espinoza (2012) would suggest that investment has indeed contributed to worker productivity growth in Oman, Qatar and Saudi Arabia. However, the second message coming from the growth accounting exercise is that efficiency has been lower in the GCC than in other fast growing emerging markets. Interpreting Pritchett (2000), it could be that the decline in TFP reflects in fact the low quality of investment undertaken in the GCC. Massive investment spending would not have been translated in useful capital because with oil revenues flowing, investment decisions were not done carefully. Pritchett (2000) argues that the accumulation of capital should in fact be modeled as: $K_t(\gamma) = (1 - \delta)K_{t-1}(\gamma) + \gamma I_t$

where $\gamma < 1$ is the efficacy of investment, i.e. the rate at which investment spending (which is what is measured in I_t , from the national accounts) is transformed into a productive unit of capital (what K_t is supposed to capture). A situation where $\gamma < 1$ would indicate that investment did not contribute to productive capital because the process of investment (investment decision, implementation, etc.) was inefficient.

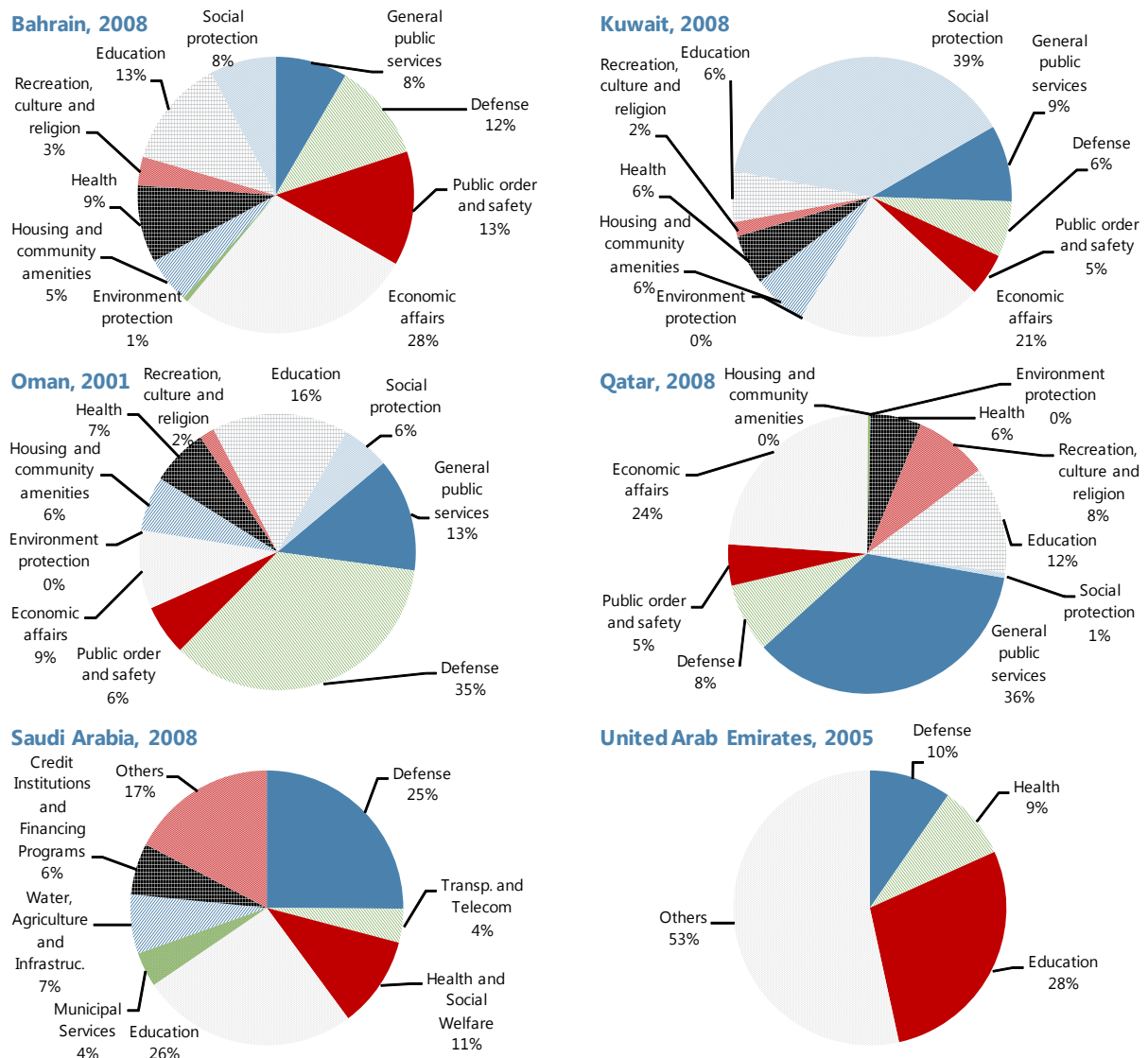
A speculative investigation of the data tends to confirm Pritchett's hypothesis that public investment can be inefficient. First, oil rich countries invest more the bigger the size of their

oil sector (Figure 2)². This suggests that the availability of resources, as opposed to the expected rates of return, is the major factor behind investment decisions. Governments spend a lot on public investment because they can, and not necessarily because those investments are needed. In the GCC, 30 to 50 percent of investment can directly be attributed to the government and this share is probably higher when taking into account subcontracting and the indirect role of the government. Second, countries that have developed sound institutions for the selection, implementation and evaluation of public sector projects (as measured by the PIMI index of Dabla-Norris et al., 2011) have benefited from higher incomes given the factors of production available (higher TFP, see Figure 3). Although the PIMI index is not available for the GCC, the evidence is that oil exporters³ have institutions of a lower quality than other emerging markets. Of course, a similar story can be built with other data on institutions, e.g. the World Bank's CPIA. Therefore, the particular link between public investment, PIMI and growth may be difficult to differentiate from what is typically found with other indexes of institutions (see for instance Hakura, 2004).

² The share of investment going to the energy sector is around 10 percent in Saudi Arabia. Although the numbers are higher in the rest of the GCC, especially in Qatar, the correlation shown in Figure 2 is not due to reverse causality.

³ The PIMI average is 1.16 for oil exporters, against 1.76 for the other emerging markets, and the difference is significant at the 1 percent confidence level. The PIMI is available for the following oil exporters: Azerbaijan, Chad, the Republic of Congo, Gabon, Kazakhstan, Nigeria, Sudan, Trinidad and Tobago and Yemen.

Figure 1. Budgetary Spending, by outlay



Source: IMF, World Bank, Al Rajhi Bank (for Saudi Arabia)

Figure 2. Investment/non-oil GDP and oil GDP/non-oil GDP (1980-2009)

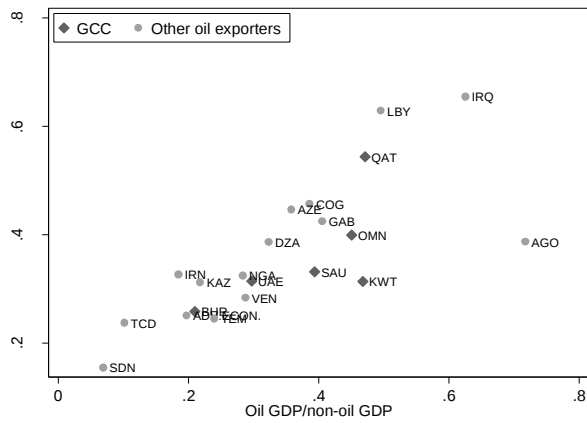
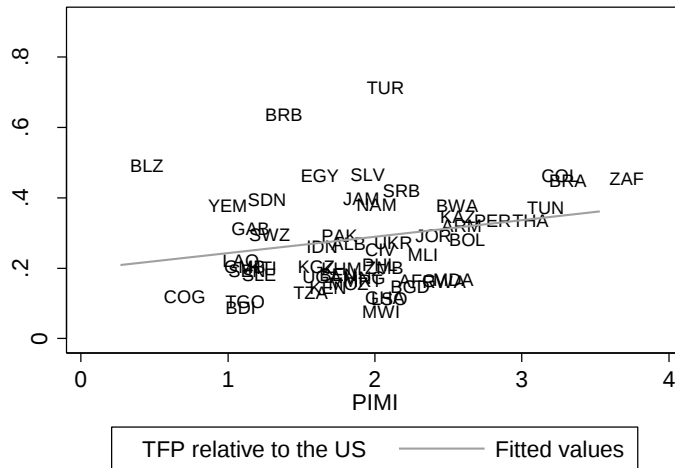


Figure 3. Total Factor productivity and the Public Investment Management Index



Source: Dabla-Norris et al. (2011) and author's calculations

In addition, even the medium-term macroeconomic returns from investment can be poor proxies for the benefits of public investment. In many situations, the benefits of public investment are non-monetary and cannot be converted into dollar equivalents.⁴ The benefits of some investments are also highly uncertain and far remote in the future, which raises the additional question of the correct coefficient of risk aversion and the appropriate discount rate. For instance, to take an extreme case, how would one price the value of organizing a World Cup for a small country in search of international prestige? In short, it seems difficult to judge, in simple economic terms, of the efficiency of investment strategies that have been as transformative as those in the GCC.

B. Support to the corporate sector and subsidies

In addition to the development of infrastructure, the diversification strategy in the GCC has been built on a multiform support to the private sector. This is witnessed by the outlay “Economic Affairs” that represent more than 20 percent of government spending in Bahrain, Kuwait and Qatar. In addition, direct subsidies or indirect subsidies (pricing under market rates) are large and amount 10 to 30 percent of government expenditure, with energy and utility subsidies the largest items (see Table 1). According to the International Energy Agency (IEA), the subsidization rate would exceed 65 percent for Kuwait, Qatar, Saudi Arabia and the U.A.E. The IEA estimates that electricity and fuel subsidies implicitly cost the government US\$ 8 billion in Kuwait, US\$4 billion in Qatar, US\$ 44 billion in Saudi Arabia, and US\$ 18 billion in the U.A.E.

The bulk of these subsidies is however not accounted for in central government financial statistics because many subsidies are only ‘opportunity costs’ of publicly owned companies

⁴ Economists often try to measure the value of non-economic gains by using conversion factors. For instance, the value of time saved in transports can be converted into its dollar equivalent using hourly wages (e.g. one hour saved = US\$ 10). However, conversions become increasingly difficult – and unconvincing – when what is being converted is not priced in markets. For instance, the value of a life saved thanks to secure transportation is sometimes converted into a dollar equivalent using the value of life insurance or the outcome of court decisions, but these conversions are uncertain and often perceived as unacceptable.

Table 1. Subsidies and opportunity costs/implicit subsidies (2010)

Subsidies in 2010, in US\$ million	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	U.A.E.
Energy 1/	-	7,620 1/	1,334	4,150 1/	43,520 1/	18,150 1/
Electricity and water	543	8,260 5/	503 3/	495 5/	-	3,370 4/, 5/
Food	114	481	-	82 2/	1,100	111 4/
Memorandum items						
GDP, in US\$ million	22,656	132,569	57,851	127,332	448,360	302,039
Government expenditure, in US\$ million	4,789	50,474	19,583	26,958	136,030	64,549

1/ includes implicit oil, gas and electricity subsidies (source: IEA)

2/ includes transfers

3/ all utilities subsidies excluding fuel for power generation

4/ Abu Dhabi only. 2011 statistics

5/ May overlap with energy subsidies

source: IEA and individual government statistics

that are selling domestically at prices below international prices (but above production costs). For the same reason, the statistics cannot distinguish between subsidies to corporates and subsidies to households.

Subsidies are a tool for industrial policy and participate to the broader plans to support businesses with the view to diversify the economy and create jobs. Has this strategy been successful and what should the policy be, looking forward?

In the GCC, diversification really means developing a non-oil sector in the economy in parallel to the oil economy, since the hydrocarbon sector will be active for around 100 years in Saudi Arabia, Kuwait and Qatar. Two questions are therefore worth considering. First, are subsidized industries providing positive productivity and technology spillovers to the rest of the non-oil sector in the economy? Second, are subsidized industries imposing high opportunity costs; in other words, how costly and distortionary are these subsidies?

Answering the first question is a task that goes beyond the scope of this paper, and that relates to the broader question of the success of industrial policies. Nonetheless, it seems reasonable to expect both direct and indirect positive spillovers from the petrochemical industry on the rest of the non-oil economy. For instance, in Saudi Arabia, since the

petrochemical sector opened up to private companies in 1995, investments were made, both jointly with SABIC, (Saudi's largest petrochemical company, which is owned at 70 percent by the government) and independently of it. The downstream sectors also attract FDI, a potential source of transfers of technology. Finally, petrochemical manufacturing requires constant innovation, and direct spillovers from such industries to other sectors of the economy could be of importance in the diversification process.

Since at existing levels of subsidies, petrochemical companies are viable in the region, a long-term policy of gradually increasing feedstock prices without eliminating their competitive advantage could help ensure their long-term viability when resources are near depletion. This strategy is currently followed in the case of Industries Qatar, for example. Nonetheless, the high-technology content and capital intensity of petrochemical industries makes them inadequate as engines of job creation in the larger countries of Oman and Saudi Arabia.

Looking at the drawbacks of the strategy, direct financial costs may not be very high. Feedstock is sold at prices below international prices to petrochemical and aluminum producers, but is often sold above the average cost of production (although not always above marginal cost). In Qatar, condensates, a by-product of gas production that exhibits near zero production costs, is a feedstock to Industries Qatar. In Saudi Arabia part of the gas used as feedstock in petrochemical industries is associated gas, produced as a by-product of crude oil.

However, there are implicit financial costs, in particular the opportunity cost of not exporting the feedstock and selling it at international prices. When downstream producers are government-controlled, the price at which the oil company sells to the downstream company does not matter because the eventual owner (the state) cashes in the profits (in the form of exports of petrochemicals, for instance) and internalizes the opportunity cost of selling below international prices and over-utilizing the feedstock. Hence, these subsidies would be innocuous in terms of the efficient use of fuel. However, when subsidies accrue to the private sector, the opportunity costs of subsidies are not internalized.

In these cases, subsidies encourage wasteful consumption, lead to excessive carbon emissions, attract smugglers, reduce incentives to increase extraction, reduce incentives to build efficient plants and create barriers to investments in alternative energies. For instance Fattouh and El-Katiri (2012) show that energy efficiency in power generation is below the world average (40 percent) in Qatar, Kuwait, Saudi Arabia and the U.A.E. although arguably these countries have the ability to use advanced technologies. In particular, the U.A.E. and Saudi Arabia would be among the least energy efficient countries in the world for power generation. In Saudi Arabia, the growing need of gas consumption led to the 2000 Gas Initiative to speed up exploration of its gas fields. But despite proven gas reserves estimated at 8 trillion cubic meters, over 4 percent of the global gas reserves, Saudi Arabia has not shown interest in exporting its natural gas.

3. An Inverse Ramsey model

Subsidies are sometimes justified because they can protect the poor. There is ample evidence, however, that generalized, untargeted, subsidies are an inappropriate tool to support lower income households. This is because larger subsidies are received by the ones who consume most, i.e. households with higher income. For instance, Arze del Granado et al. (2010) reviewed the evidence for 20 developing countries and found that on average, gasoline subsidies accrue for 61 percent to households in the highest consumption quintile, whereas households in the lowest quintile (the 20 percent poorest households) received only 3 percent of the subsidies. The distribution of subsidies is less skewed for other products but this pattern of regressive subsidies is common for energy and utilities.

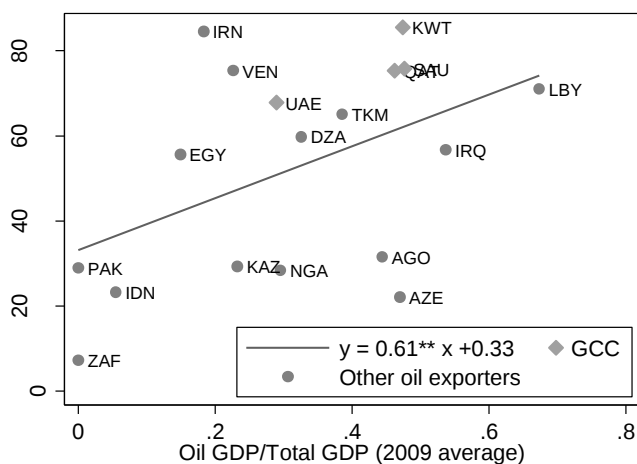
Subsidies can also be a simple way for the government to redistribute the natural wealth of the country (oil revenues) to its nationals, independent of their income level. While lump sum transfers to households would be the first-best solution, from an economic efficiency point of view, and would also allow the government to target subsidies to nationals, there may be several reasons why governments prefer to give subsidies. First, governments may think that markets do not always lead to efficient outcomes, for instance if they believe that their citizens would under-invest in their education if they had to pay its full cost. Second, subsidies act as conditional transfers and allow governments to determine acceptable

conditions for citizens to receive government money (one needs to work to receive wage subsidies, to study to receive education allowances, etc.).

Third, several authors have suggested that retaining direct control of how oil money is spent allows the political establishment to evade transparency and accountability (Morrison, 2009, Birdsall and Subramanian, 2004). In the words of Sala-i-Martin and Subramanian (2003): “oil accounts for a substantial share of total government revenues. As such, the government has little incentive to provide services efficiently because the discipline exerted by the need to tax the public is largely absent: oil revenues are manna from heaven and keep flowing regardless of what the public sector delivers.” Finally, direct redistribution policies would open national debates on the fair distribution of resources, and reduce the power of government. Only advanced regions (Alaska, Alberta) have been able to apply such policies (Auty, 2001).

Governments use therefore indirect methods, which include hiring for the public sector at relatively high wages, subsidizing salaries for nationals in the private sector (in particular for the youth), subsidizing consumption of goods (free electricity, subsidized healthcare and mortgages), providing education to nationals. Richer countries tend to provide larger subsidies. Figure 4 shows for instance the subsidization rate on fuel as a function of the size of the oil sector in the economy.

Figure 4 Subsidies and size of the oil sector



Source: International Energy Agency and author's calculations

Subsidies, the development of public infrastructure, and the provision of public sector jobs are different ways for the government to redistribute its oil revenues. The problem of the government is therefore similar (but in reverse) to the Ramsey (1927) problem of optimal taxation commonly studied in public economics, where a government that needs to tax the private sector searches for the optimal way to allocate the distortions due to taxes across markets (see for instance Cullis and Jones, 1992). Three channels of spending seem most relevant: public sector employment, the provision of public capital, and subsidies. This section presents the general (inverse) Ramsey problem of an oil-rich government.

Assume that production is a linear function of labor used in the private sector L_p ,

$$Y = AL_p \quad (1)$$

and that the stock of public capital G affects productivity: $A = A_0(1+G)$. Wages in the private sector w_p are set competitively by firms taking as given the level of productivity A :

$\max \pi = Y - w_p L_p$ implies $w_p = A = A_0 (1+G) = w (1+s_w)$ where $w = A_0$ is the wage that would prevail absent of any public investment. In this very simplified model, public investment G is equivalent to a multiplicative subsidy on private sector wages.

Households are endowed with time to work, equal to D , and can consume tradables T (with a price equal to 1), nontradables NT (with a price p_{NT}), and enjoy leisure $0 < x < D$, with a utility function: $u(c_T, c_{NT}, x)$.

The government can subsidize labor (by increasing the stock of public capital, which has the same effects than subsidizing wages in this model) and can provide subsidies on non-tradable consumption goods. We assume tradable goods cannot be subsidized because otherwise the international demand for these goods would generate large losses to the government – with little benefits for the nationals.⁵

The household problem is to maximize utility given a budget constraint⁶

$\max u(c_T, c_{NT}, x)$, subject to

$$c_T + p_{NT}(1-s_{NT}) c_{NT} = w(1+s_w) (D-x) \quad (2)$$

An interior solution is such that the ratios of marginal utilities equal relative prices (net of subsidies):

$$(\partial u / \partial c_{NT}) / (\partial u / \partial c_T) = p_{NT}(1-s_{NT}) \quad (3)$$

⁵ Note that the Ramsey problem requires that one good cannot be taxed: if all goods are taxable or can be subsidized, the problem is trivial as the optimal policy is to tax/subsidize all goods with the same rate, ensuring that relative prices are not distorted. The literature has usually assumed that leisure was not taxable, but this assumption is innocuous for the general results given by the model.

⁶ The symmetry with the original Ramsey problem (see for Auerbach, 1985) is clear when rewriting the constraint as $c_T / (1+s_w) + p(1-s_{NT}) / (1+s_w) c_{NT} + w x = w D$. The choice of subsidies s_w, s_{NT} is equivalent to a choice of relative prices for c_T and c_{NT} .

$$(\partial u / \partial x) / (\partial u / \partial c_T) = w(1 + s_w) \quad (4)$$

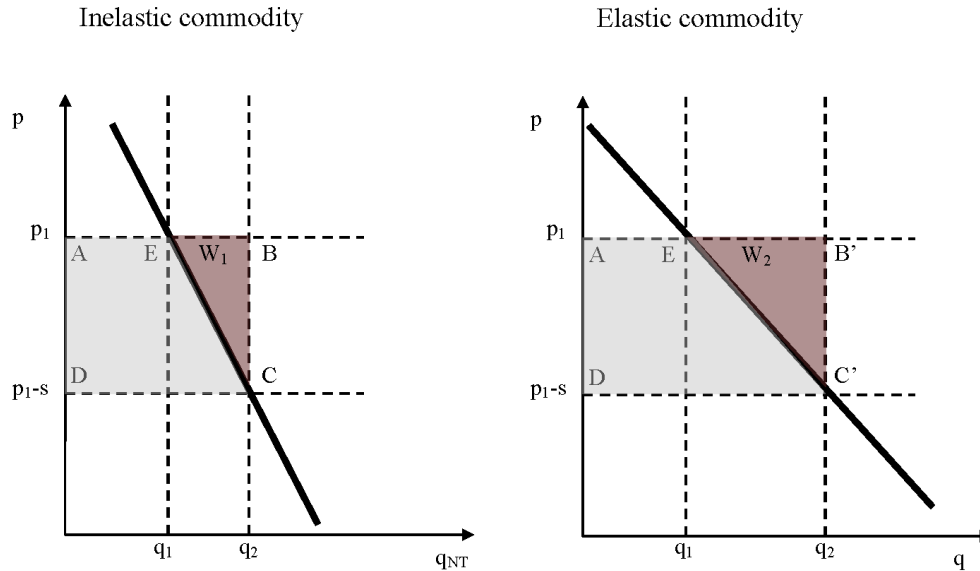
The problem of a benevolent government is to maximize utility of the representative household, taking into account the optimal behavior of the workers (equations 3 and 4) and using the oil resources to subsidize labor and the consumption of non-tradables. The amount of the subsidies is limited by the budget constraint of the government, which is such that the total cost of subsidies equals oil rents X (net of any extraction costs):

$$w s_w (D - x) + p_{NT} s_{NT} c_{NT} = X \quad (5)$$

The problem of the government is identical to the one solved by Ramsey (1927), except that X , s_w and s_{NT} are positive (the original Ramsey problem is for a government taxing households to finance a given government expenditure).

The objective of the government can be shown to be equivalent to reducing the overall deadweight losses due to government intervention. As can be seen from Figure 5, subsidies generate welfare losses that are larger for commodities the demand of which is most sensitive to prices. The left panel of Figure 5 shows the demand curve (quantities of the commodity demanded are shown on the horizontal axis, for a price p on the vertical axis) for a relatively inelastic commodity. A subsidy s reducing prices from p_1 to $p_1 - s$ increases consumer welfare by the light grey trapezoid AECD, whereas the cost to the government is the rectangle ABCD. The loss for the economy is W_1 , the area of the dark grey triangle EBC. This social loss is the symmetric loss to that due to taxes, first described by Dupuit (1844) and popularized by Harberger (1964). When demand is more elastic (right panel of Figure 5), the welfare loss is greater: $W_2 > W_1$.

Figure 5. Subsidies and welfare losses



Auerbach (1985) provides a modern treatment, and the analytical solution of the Ramsey problem shows that, when demand⁷ for the different ‘commodities’ (non-tradables, tradables, and leisure) are insensitive to the prices of other commodities (i.e. commodities are neither substitute nor complement), the solution for the government is to tax (in our case, subsidize) commodities that are least elastic to prices. This solution ensures that the marginal deadweight loss, per additional unit of dollar distributed to nationals, are equalized across commodities and therefore that it is not possible to reduce overall deadweight losses by increasing subsidies in one commodity and reducing subsidies in another one.

The model provides therefore predictions on the scale of public investment and the pervasiveness of subsidies and distortions in an oil rich economy. It is indeed optimal to subsidize all commodities that can be subsidized, as opposed to focus subsidies in a narrow range of goods. In addition, the model implies that commodities for which demand is least

⁷ Demand could refer either to Hicksian or to Marshallian demand (see page 93 in Auerbach, 1985),

elastic to prices should be subsidized at higher rates. This suggests subsidizing basic needs at higher rates, in particular food, healthcare and education.⁸ The Ramsey solution that reduces allocative inefficiency is therefore compatible with the equity objective to subsidize basic needs. In addition, there are long-term growth benefits of increasing skills, which are not taken into account here.

The model does not support the GCC region's heavy spending on energy subsidies. There are no justifications for concentrating subsidies on a narrow range of products and energy subsidies are also very distortive: according to the Ramsey model, they are therefore not an efficient way to distribute oil wealth. Demand for energy is typically very sensitive to prices, with elasticities around -0.7 (see for instance Iimi, 2010). Al-Faris (2002) also found that the price elasticity of electricity demand is between -1.1 and -3.4 in the GCC countries.⁹ On top of this allocative efficiency argument, one should also remember that energy subsidies benefit disproportionately richer households. There are also negative environmental externalities to the use of fuels, which have in fact prompted many countries to increase taxation on these products.

Finally, the model has normative implications for the optimal phasing out of subsidies. According to the Ramsey model, when cuts to subsidies are envisaged, subsidies should be decreased across a wide range of products, because the welfare costs of inefficiencies depend on all the relative prices.

⁸ Bread, cereals, oil and fat, fruit and vegetables have been found to have low price elasticity in the GCC, between -0.2 and -0.35; see Seale et al. (2003). Ringel et al.(2005)'s review of the literature for the U.S. suggests a price elasticity of -0.17 for healthcare services. Shires (1995) found demand elasticities in college education to be relatively low, between -0.05 and -0.2; see also Heller (1997) for a survey.

⁹ On the other hand, Narayan and Smyth (2007) found that demand for oil is inelastic to prices in the region. It is however difficult to estimate price elasticities of demand in the GCC because prices are often controlled and not very volatile, which makes estimates less robust.

4. Distortions in labor markets

In the previous section, we described market subsidies that affect continuously the final price of goods, in the tradition of the public finance literature. Government spending can however generate other distortions, especially in dynamic settings. For years, in Egypt, college graduates were entitled to public service jobs. Because the number of graduates exceeded the needs of the government, college graduates had to queue for public service jobs and discontent grew (Richards and Waterbury, 2007). In Saudi Arabia, the Real Estate Development Fund (REDF) has been providing highly subsidized loans, but as demand exceeded supply, applicant waitlists can exceed ten years (IMF, 2006). The scheme has also affected the development of the private market for mortgages.

In most of the GCC, highly paid public sector positions are also used as another channel to redistribute oil revenues. These positions are preferred, especially by women, over private sector jobs, but the government is of course unable to hire all the candidates in the more populated states.¹⁰ Wage disparities between public and private sector jobs are striking in the GCC: the lowest paying public sector job pays about 30 percent more than a private sector job.

This section proposes a simple model of the labor market capturing these stylized facts. The model assumes that recruitment of public servants can induce a large disincentive to take private sector positions. We compute the conditions under which the disincentive is so strong that overall employment is actually decreased as public servants are being hired. Our model has a similar take than that in Gelb et al. (1991). Gelb et al. (1991) simulate a two-sector Harris-Todaro model where an increase in wages in cities (for instance due to an oil windfall) attracts workers from the rural sector. Unemployment increases in cities and the government's attempt to decrease unemployment by promoting urban jobs (financed by

¹⁰ For instance in Saudi Arabia, the saturation of public sector jobs, coupled with increasing labor forces, has made job creation for nationals in the private sector a policy priority.

taxation) is self defeating because it increases further the incentive to leave farming to find employment in cities.

Our model assumes there are three types of nationals: workers in the private sector L_p , workers in the public sector L_g , and, given an exogenous labour force L , unemployed workers are $L_u = L - L_p - L_g$ (the number of workers L_p , L_g and therefore L_u will be determined in equilibrium).

Nationals can look for jobs in the private sector and get a salary w_p , but they can also apply or queue for government jobs, which pay higher salaries ($w_g > w_p$). We assume that if a national applies for a government job and is unsuccessful, he or she remains unemployed and earns a lower income w_u , representing the value of leisure and of social benefits provided by the government. Therefore we assume $w_u < w_p < w_g$. Without loss of generality, we normalize w_u to 0.

The probability of being unemployed after applying for a government job is (this probability will be solved in equilibrium):

$$v = (L - L_p - L_g) / (L - L_p) \quad ; 0 < v < 1$$

The probability of succeeding in capturing a government job is:

$$1 - v = L_g / (L - L_p)$$

The equilibrium condition in the labor market for nationals is similar to a no-arbitrage condition:¹¹ the expected wage of queuing for a government job must equal the income guaranteed in the private sector. The income earned with a job in the private sector is equal to the income paid by the firm (w_p) plus the subsidies provided by the government ($s w_p$), which implies that the equilibrium condition in the labor market is

¹¹ We assumed implicitly that the job seeker is risk neutral. His or her utility is simply linear in income.

$$(1+s)w_p = v w_u + (1-v) w_g = (1-v) w_g \quad (6)$$

since we set earlier $w_u = 0$.

Let us assume that wages in the private sector are a decreasing function of L_p . For instance, with a production function using labor L_p and a stock of capital K :

$Y = L_p^\theta K^{1-\theta}$ implies wages are set competitively to $w_p = \theta L_p^{\theta-1} K^{1-\theta}$.

$$\text{This yields } \partial w_p / \partial L_p = (\theta-1) w_p / L_p < 0. \quad (7)$$

Equation 6 and Figure 6 provide the key insights into the impact of government decisions on the labor market. Figure 6 shows the equilibrium in the labor market, i.e. the solution of the following equation obtained by replacing w_p using equation 6

$$(1+s)w_p = (1-v)w_g \Rightarrow (1+s) \theta L_p^{\theta-1} K^{1-\theta} = L_g w_g / (L - L_p)$$

The comparative statics in the labor market are intuitive: if the government increases the labor subsidy from s_0 to $s_1 > s_0$, the returns to working in the private sector increase and employment in the private sector increases (see dashed line on left hand side panel). This will reduce unemployment *ceteris paribus*. If the government increases its payroll ($w_g L_g$), it increases the expected payoffs of queuing for a government job, and reduces the incentive to accept a private sector job. This effect implies that an increase in government employment L_g can reduce private sector employment (see dashed line on right hand side panel).

What is the effect of government employment on overall unemployment? We need to differentiate the equilibrium condition $(1+s) w_p (L - L_p) = L_g w_g$ and investigate whether $dL_p/dL_g < -1$ (i.e. whether one additional government job reduces private sector employment by more than one job because of the incentive to queue).

Differentiating the equilibrium condition yields:

$$(1+s) (\partial w_p / \partial L_p (L - L_p) - w_p) dL_p = w_g dL_g$$

$$\text{Therefore } dL_p / dL_g = w_g / [(1+s)(\partial w_p / \partial L_p (L - L_p) - w_p)] \quad (8)$$

Note that $dL_p / dL_g < 0$ because $\partial w_p / \partial L_p < 0$. In addition, from equation 7:

$$\partial w_p / \partial L_p (L - L_p) - w_p = w_p ((\theta - 1) (L - L_p) / L_p - 1)$$

Therefore $dL_p / dL_g < -1$ if and only if

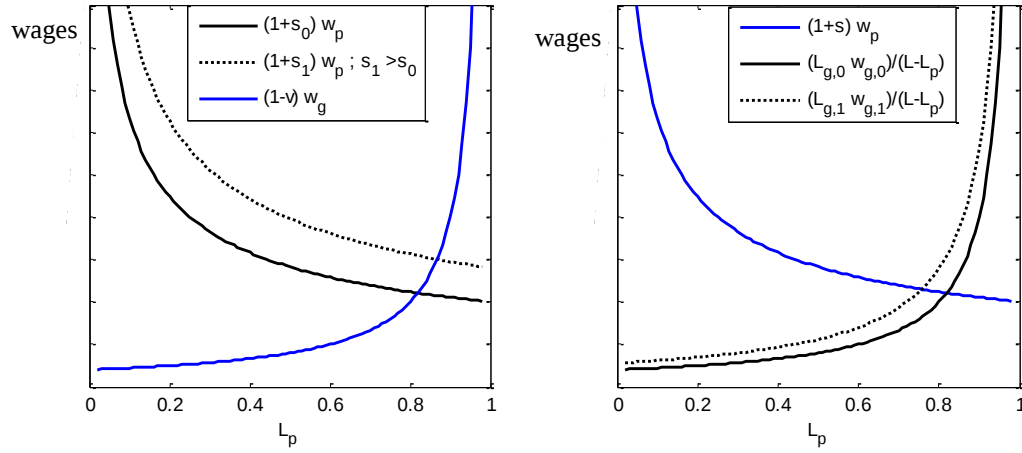
$$w_g > (1+s) w_p ((1 - \theta) (L - L_p) / L_p + 1)$$

It is therefore possible that with high levels of public wages, increases in government hiring decreases overall employment. For instance, if only 50 percent of nationals are working in the private sector and if $\theta = 0.5$, then $(1+s) w_p ((1 - \theta) (L - L_p) / L_p + 1) = 1.5 (1+s) w_p$. Government hiring would increase unemployment if government salaries are 50 percent higher than private sector salaries, net of wage subsidies.

The model has assumed until now that wages in the private sector respond to changes in the (domestic) labor supply. To a large extent, however, private sector wages are determined by the reservation wages of expatriate workers. The main result of the model is unchanged under the assumption that private sector wages are exogenous (in which case the labor demand curves are horizontal in Figure 6). In particular, an increase in public employment reduces private sector employment, and setting $\partial w_p / \partial L_p = 0$ in equation 8, one finds that

$$dL_p / dL_g = -w_g / [(1+s)w_p] < -1 \text{ if and only if } w_g > (1+s)w_p$$

Figure 6. Equilibrium in the labor market



5. Conclusion

Government spending is high in the GCC and even ratios of spending to GDP underestimate the pervasive role of government in the economy. Oil revenues accrue to the government and the way the oil money is spent has decisive impacts on the non-oil sector. Capital accumulation by the public sector has been strong and contributed to the high levels of income per capita. However, it is difficult to sustain the quality of investment when volumes are so high, and the evidence suggests that the institutions that matter for public investment decisions are weaker in oil exporting countries

Large government subsidies also alter markets. Subsidies affect the demand for education, the labour supply in the private sector, the demand for mortgage financing, the consumption of energy, etc., and in a 'first best' view of the world, these subsidies are inefficient. Some inefficiency should however be expected for rich countries that distribute oil revenues to their population, since this situation mirrors that of a government that collects distortionary taxes to finance public goods. The relevant question, which is well-studied in the public finance literature, is how to distributive oil windfalls (with 'negative' taxes) in the least distortive fashion. The Ramsey theory is applicable here and the answer is that subsidies should be distributed across a wide range of goods (and services), with higher rates of

subsidies for goods whose demand is least price-elastic: in practice, basic needs such as food, education, and health care. In addition, the Ramsey theory suggests that when subsidy policies are under review (because of the government has less money available or wants to save more), changes to subsidies should be across the board, so that relative prices are not affected.

Some subsidies however create perverse mechanisms in dynamic contexts. In particular, mortgage subsidies and high wages in the public sector have created ‘queues’: the benefits of landing a public sector job (or getting a subsidized mortgages) may be so high that some would rather wait and stay unemployed (or rent an apartment) in the hope of obtaining the coveted benefit later in time rather than going for an alternative (private sector job; commercial bank mortgage). These distortions are highly inefficient and may be worsened by further government intervention: for instance, a wave of hiring in the public sector may decrease labor supply to the private sector (or increase unemployment) since job seekers understand that the probability of landing a government job has increased. Therefore, the distributive policies in the GCC should be evaluated carefully, taking into account both theory and experience with specific government programs, so that this kind of egregious distortions be removed.

References

- Al-Faris, A. R. F. (2002). The demand for electricity in the GCC countries, *Energy Policy* 30: 117–124.
- Arze del Granado, J., Coady, D., and Gillingham, R. (2010) The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries. IMF Working Paper No. 10/202.
- Auerbach, A. (1985). The Theory of Excess Burden and Optimal Taxation. In Auerbach, A. and Feldstein, M. (eds.), *Handbook of Public Economics*, Amsterdam: Elsevier Science Publishers (North-Holland).
- Auty, R. (2001). Political Economy of Resource Abundant States. In Auty (ed) *Resource Abundance and Economic Development*, Oxford University Press.
- Bank, A.R. (2008). Saudi Arabia's 2008 National Budget: Highlights and Analysis.
- Birdsall, N. and Subramanian, A. (2004). Saving Iraq from Its Oil. *Foreign Affairs*, 83(4): 77-89 (July/August).
- Cullis, J. and Jones, P. (1992). Public Finance and Public Choice. McGraw-Hill, Chapter 16.
- Dabla-Norris, E., Brumby, J., Kyobe, A., Mills, Z., and Papageorgiou, C. (2001). Investing in Public Investment: An Index of Public Investment Efficiency. *Journal of Economic Growth*, forthcoming.
- Dupuit, J. (1844). De la Mesure de l'Utilité des Travaux Publics. *Annales des Ponts et Chaussées*. Translated and reprinted in Arrow, K. and Scitovsky, T. (eds.), 1969, AEA Readings in Welfare Economics.8: 255-283.
- Espinoza R. (2012), Factor Accumulation and the Determinants of TFP in the GCC, OxCarre Working Paper.
- Fattouh, B. and El-Katiri, L. (2012). *Energy Subsidies in the Arab World*, Arab Human Development Report. Research paper Series, UNDP.
- Gelb, A. H., Knight, J., and Sabot, R. (1991). Public sector employment, rent seeking and economic growth. *The Economic Journal*, 101: 1186-1199

- Heller, D. E. (1997). Student Price Response in Higher Education: An Update to Leslie and Brinkman. *The Journal of Higher Education*, 68: 624-659.
- Hakura, D. (2004). Growth in the Middle East and North Africa. IMF Working Paper, 04/56.
- Harberger, A. (1964). Taxation, Resource Allocation and Welfare. The Role of Direct and Indirect Taxes in the Federal Reserve System, Princeton: Princeton University Press for the NBER and Brookings Institution.
- International Energy Agency (2010). World Energy Outlook. Online database available at <http://www.iea.org/subsidy/index.html>
- IMF (2006). Saudi Arabia Financial System Stability Assessment. IMF Country Report No. 06/199, IMF: Washington D.C.
- Limi, A. (2010). Price Elasticity of Nonresidential Demand for Energy in South Eastern Europe. Policy Research Working Paper 5167, World Bank.
- Luciani, G. (2007). The GCC Refining and Petrochemical Sectors in Global Perspective. In Gulf Geo-Economics. (eds.) Eckart Woertz (Dubai: Gulf Research Center).
- Morrison, K. (2009). Oil, non-tax revenue, and the redistributive foundations of regime stability. *International Organization*, 63: 107-138.
- Narayana, P. K. and Smyth, R. (2007). A panel cointegration analysis of the demand for oil in the Middle East. *Energy Policy*, 35: 6258–6265.
- Pritchett, L. (2000). The Tyranny of Concepts: CUDIE (Cumulated, Depreciated, Investment Effort) Is Not Capital. *Journal of Economic Growth*, 5(4): 361-84.
- Ramsey, F.P. (1927). A Contribution to the Theory of Taxation. *The Economic Journal*, 37: 47-61.
- Richards, A. and Waterbury, J. (2007). *A Political Economy of the Middle East*. Third Edition, Westview Press, Colorado: Boulder.
- Ringel, J., Hosek, S., Vollaard, B., and Mahnovski, S. (2005). *The Elasticity of Demand for Health Care: A Review of the Literature and Its Application to the Military Health System*. RAND National Defense Research Institute, RAND: Washington DC.
- Sala-i-Martin, X. and Subramanian, A. (2003). Addressing the Natural Resource Curse: an Illustration from Nigeria. NBER Working Paper No 9804, NBER: Cambridge, MA.

Seale Jr, J., Regmi, A., and Bernstein, J. (2003). International Evidence on Food Consumption Patterns. United States Department of Agriculture, Economic Research Service. Technical Bulletin Number 1904.

Shires, M. A. (1995). The master plan revisited (again): Prospects for providing access to public undergraduate education in California (draft). Santa Monica: Rand Institute, DRU-965-LE.