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Assessing the Impacts of Phasing Out Fuel and Utility Price Subsidies

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TABLE OF CONTENTS

ACRONYMS/ABREVIATIONS

API	Administered price increases
BMPI	Basic basket price index
BNA	Banco Nacional de Angola
CPI	Consumer price index
CUA	Catholic University of Angola
EDEL	Empresa de Distribuição de Electricidade de Luanda
ENE	Empresa Nacional de Electricidade
EPAL	Empresa Pública de Águas de Luanda
GoA	Government of Angola
IMF	International Monetary Fund
INE	Instituto Nacional de Estatísticas
INEA	Instituto de Estradas de Angola
LPG	Liquified petroleum gas
MBPI	Medium basket price index
UNDP	United Nations Development Program
USA	United States of America
WFPI	Weighted fuel price index
WHO	World Health Organization

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Executive Summary

i. **Subsidies can be removed in Angola in a phased way with the fiscal savings used to compensate the poor and improve the quality of public services.** In the context of a policy program aimed at gradually eliminating fuel price subsidies, estimated to be around 4% to 5% of GDP, the government plans to also phase out utility price (water and electricity) subsidies. This report looks into the economic and welfare impacts of such a program and makes recommendations on how to design a strategy to eliminate subsidies in Angola. The strategy should clearly differentiate fuel price subsidy removal from utility price subsidy removal. In both cases, a phased approach is recommended. In the case of fuel price subsidy removal, Sonangol's current pricing mechanism should be reviewed as part of the phase out strategy. In the case of utility price subsidies, significant improvements in infrastructure and in the managerial efficiency of the public utility companies are required before the removal of the subsidies can take place. In order to secure public support for the strategy and avoid unwanted macroeconomic consequences, the fiscal savings obtained with the removal of subsidies should be used to compensate the poor and to improve public service delivery.

Fuel and Utility Price Subsidies are Sizable in Angola

ii. **Fuel prices in Angola are one of the lowest amongst African countries and other oil-rich countries elsewhere**. Fuel subsidization is common practice not only in Angola, but in many other oil rich countries, such as Iraq, Iran, Saudi Arabia, Libya, Egypt, Algeria, Indonesia, Malaysia, Venezuela and Bolivia. Angola ranks fourth in a list of African countries with the lowest prices of gasoline and diesel. In 2004, for example, the US gasoline and diesel retail prices per liter were 54 and 57 cents, respectively, while in Angola, gasoline and diesel retail prices per liter in US dollar cents were 39 and 29. The size of the subsidies in Angola is even higher if one considers the pricing mechanism used by Sonangol, sometimes exceeding actual prices by over 300% for gas, gasoline, diesel and kerosene.

iii. **There are also equally important subsidies in the provision of water and energy through the public utility companies**. The rationale for the governmental subsidy transfer in the electricity and water sectors has to do with the inability of the public utility companies to raise sufficiently high revenue from sales to meet their costs. This phenomenon has not only been the product of utility companies' inefficiencies in properly metering, billing customers for service delivered and preventing the surge in illegal connections, but also of the fact that electricity and water prices have been set by the Ministry of Finance at levels below the long run marginal cost. In the electricity sector, for example, these are affirmed to be US$0.11 per kWh, but the prices practiced by the utility are currently close to US$0.005 per kWh. In the water sector, in order to

cover the financial loss of about US$6 million, the utility company has received price and operational subsidy amounts of about US$ 7.4 million and US$0.9 million, respectively.

iv. **The vast majority of the population considers all public services to be important but of poor quality**. Mostly due to deterioration of physical and human capital during the long war, public service delivery of water and energy is neither constant nor comprehensive and is therefore of low quality. The provision of other important services by the government (such as public education, transportation, sanitation, and health) is also considered to be of low quality while at the same time considered to be highly important by the population. Poor households usually find it difficult to have access to formal public service delivery and have to recur to secondary markets for some services (such as water and some types of fuel) where they pay a high price. These households are potentially the beneficiary of gas and kerosene subsidization but not all can afford them and/or have easy access to these fuels. Fuel price subsidization overall has been found to benefit mostly the rich and not the poor.

v. **The main beneficiaries of utility and fuel price subsidization are the richest households and not the poorest.** The profile of the households who benefit from utility and fuel price subsidies reveals that the main beneficiaries are homeowners who reside in large houses and apartments, who own generators, refrigerators and computers, and who are in the third to the fifth income quintiles. More specifically, gasoline expenditure appears to be relatively more important for households within the fifth income quintile than for households within the other four quintiles because this energy source is highly used by well off households in the generation of lighting or to fuel their automobiles. These well off households are the ones who will be most directly affected by the removal of fuel price subsidies in the first instance while the poorest households could become better off if the amount spent on subsidies was more directly spent on improving their welfare.

A Two-Pronged Approach to Phase Out Subsidies

vi. **The government should adopt a phased approach to eliminating fuel price subsidies**. In the first stage, the authorities will need to announce a comprehensive program to deal with subsidies in a phased strategy. Some limited increase early in 2006 together with the announcement to show intent would be a good way to start the program, but the announcement of the program would have to state clearly that the initial objective is, for example, to align fuel prices with the 2006 budget's implicit oil price (US$45/barrel). A larger increase could be introduced in mid-2006 matched with a program to spend the funds saved through a compensation program and on needed infrastructure. In the second stage, the current pricing mechanism used by Sonangol should be reassessed and the adjusted level of subsidies phased out gradually while the compensation program designed in the first stage continues to be implemented. At any point in time, the program should be adjusted in case there is a crash in international oil prices.

vii. **Removal of utility price subsidies is more complex and requires investment in infrastructure and administrative capacity in the utility companies first**. There are

considerable challenges to be faced by the authorities prior to the complete elimination of energy and water subsidization in Angola. First, the government needs to invest in the public network for distribution of water and energy. Second, managerial efficiency will also have to improve significantly so that the public utility companies can operate according to international standards and be able to manage appropriately their billing and collection practices and minimize leakages due to illegal connections. Only after these two steps are taken utility price subsidies should be eliminated.

viii. **A strategy to phase out subsidies has to be founded on the belief that Angola can use the resources currently allocated to subsidies for more productive uses**. Given this, the main policy issues are how to reduce the subsidies while maintaining macroeconomic stability; better allocating spending for development and poverty reduction; compensating the losers and improving social protection for the poor; and selling a coherent and comprehensive package to the public to moderate resistance.

ix. **In contemplating the implementation of a policy of gradually and periodically adjusting fuel and utility prices, Angolan authorities should not neglect the policy's political costs.** This is particularly true now in the eve of major elections. International evidence demonstrates that fuel price hikes unaccompanied of a set of palliative measures typically leads to public protests and may trigger violence and social unrest, even at times following elections. The incentives of political contestants of generating public debate and criticism of fuel and utility price increases at times preceding elections are heightened. Incumbents anticipate this and thus know that if they support fuel price increases, they may end up losing high numbers of votes to their competitors. The experience of other countries demonstrates that any program to reallocate fiscal spending should pay close attention to the following broad principles:

- **Political attractiveness:** Off-setting, politically attractive expenditure programs are key to the political and social sustainability of a subsidy removal. A high visibility and credible announcement of compensating measures is an indispensable feature of the package.

- **Pro-poor and effective targeting:** Measures should ideally be those that maximize development and poverty reduction impact. "Compensation" programs should be targeted to benefit the poor and possibly other key losers of the subsidy removal as well. They need to be seen to do so as well.

- **Speed of spending and impact on households:** The speed at which programs are designed and money is spent is important for macroeconomic reasons, while the speed at which programs impact poor households is important for compensatory and political economy reasons.

How to Moderate Resistance and Compensate the Public

x. **One of the palliative measures that may bring large benefits to the poor is a water and sanitation policy aimed at improving the quality of these services.** The welfare analysis of this report indicates that changes in water price will bring about a

much larger marginal social impact than changes in fuel prices. Given the precarious state of affairs in water infrastructure, management and service delivery, there appears to be ample room for policy makers to reform the public water sector with the goals of making it more efficient, expanding water supply to the population and improving water quality. The funds needed to finance such a large venture could come from funds saved with the gradual phase out of fuel subsidies and from private sector participation.

xi. Other palliative policies that can be implemented in Angola and that have been used in other countries which faced the question of how to compensate the poor in a program to phase out subsidies are as follows:

1. **Public Education Policy**: Promotion of voucher systems, conditional cash transfers and school meals in order to offer incentives to parents to send their children to school and incentives for children to stay in school;
2. **Health Care Provision Policy**: Promote infrastructure investment, offer preventive care and mobile clinics to expand health care service access;
3. **Public Transportation Policy**: Creation of a social pass which can be used in buses and vans interchangeably, cost subsidization of van service based on utilization rates, implement employer-sponsored passes.

xii. **A successful package to phase out subsidies in Angola will demand political commitment and a good implementation and monitoring strategy.** In order to successfully implement the package the GoA will need to form teams and attribute responsibilities. The teams should cover the following main areas: (i) macroeconomic and fiscal issues; (ii) expenditure programming (social protection and compensatory expenditure, and other development and poverty reducing expenditures); and (iii) socialization of savings. They would have to work together and consult each other in order to develop initial proposals based on their own experience and on the findings of this report. The World Bank stands ready to assist the GoA in each of these areas.

I. INTRODUCTION

1. In the context of a policy program aimed at gradually eliminating fuel price subsidies, the government plans to also phase out subsidies of public utilities (water and electricity). If the GoA successfully eliminates all subsidies, its fiscal position will surely improve. According to figures shown herein, the GoA subsidy liability in 2004 amounted to over US$1.2 billion. The results of our analysis show that the associated direct social costs of completely removing fuel subsidies are likely to be small and disproportionately affect the poor only as much consumption of LPG and kerosene are concerned. The estimated inflationary effect of fuel price increases is not high enough to cause much concern – it can be dealt with in the present context of low monthly inflation rates provided there is a sound strategy of gradual adjustments in fuel prices.

2. In the context of the Bank's Country Economic Memorandum and of the negotiations of a Staff Monitored Program between the Government and the IMF, with financial support from the British Embassy in Luanda, the Bank commissioned this study of the stated policy of phasing out fuel and utility price subsidies. The main objective of this report is to assess the likely macroeconomic and welfare impacts promoted by a policy of gradually removing fuel and utility price subsidies in Angola. The policy in question will inevitably cause two key macroeconomic impacts. It will lower and eventually eliminate, if completely successful, governmental subsidy expenditures. It will also generate inflationary pressures. As for the welfare impacts, we consider the potentially negative effects brought about by increases in fuel and utility prices on the welfare of the average resident in Luanda.

3. The methodology of analysis involved the undertaking of a specific rapid household survey in Luanda to gather information on the incidence of utility and fuel price subsidies and to learn about the perceptions of the population regarding the quality of the services provided by public utilities. Based on the survey data, demand functions were estimated for a sample of households in Luanda's urban and rural areas. The estimations allowed us to derive the welfare impacts associated with various hypothetical situations concerning the rates at which subsidies are removed. Data collection for the household survey was administered by Datametrica, a consulting firm based in Brazil. Datametrica hired a team of experts from the Catholic University of Angola (CUA) to help it solve logistical problems, recruit and train local interviewers and to prepare the data set. Most of the interviewers were CUA students. The activities started on April 20, 2005 and ended on May 10, 2005. A total of 1,428 households were surveyed.

4. In addition to the data collection effort, the qualitative analysis of the welfare impacts of phasing out fuel and utility subsidies benefited from several consultations in different stages of the work with key representatives from civil society organizations, the donor community, academia, and the private sector in Luanda. The team also met in different occasions with key government officials from the public utility companies, the

Ministry of Finance, the Ministry of Planning, the Ministry of Energy and Water, the Ministry of Petroleum, and with staff from Sonangol, the national oil company. A brief description of the outcome of such consultations at the inception stage of this work is included in the annex to this report.

5. We organized the ordering of topic presentation in order to better address the following main questions: (i) How important are fuel and utility subsidies? (ii) Who benefits from fuel and utility subsidization? (iii) What are the macroeconomic and welfare impacts of fuel and utility price increases? (iv) How should the phase out of fuel subsidies be orchestrated? (v) Which palliative policies should be implemented in order to compensate the losers? In section 2, we examine the international evidence on fuel subsidization, and discuss the importance of fuel and utility subsidization in Luanda and the inefficiencies associated with fuel distribution and electricity and water provision. In section 3, we study issues related to incidence of fuel and utility subsidies and the perceived consumption benefits from public service obtained by the population. In section 4, we analyze the macroeconomic and welfare effects of fuel and utility price increases. In section 5, we discuss how the phase out of fuel subsidies should be designed and implemented and propose a set of palliative policies consistent with our findings.

II. FUEL AND UTILITY SUBSIDIZATION

6. What are the problems associated with subsidies? This is the main theme of this section. In our attempt to satisfactorily address this issue, we will study the international evidence concerning fuel subsidization and its problems and examine the peculiarities of fuel subsidization in Angola and utility subsidization in Luanda.

1. Fuel Subsidization: International Evidence

7. How much do Angolans pay for fuel in comparison to other countries in Africa and other parts of the world? The following two charts demonstrate how Angola compare with selected African countries in terms of gasoline and diesel retail prices in November 2004. While Libya had the lowest gasoline and diesel retail prices in Africa, Angola ranked fourth in the list of African countries, starting from the bottom.

8. A widely used measure to determine the level of fuel subsidization present in a given country follows from a direct comparison between the country's fuel retail price and the US fuel retail price. If the country's fuel retail price is lower than the US retail price, the difference between the two prices yields the fuel subsidy. For example, in November 2004, the US gasoline and diesel retail prices per liter were 54 and 57 cents, respectively. In Angola, gasoline and diesel retail prices per liter in US dollar cents were 39 and 29, respectively. Thus, gasoline and diesel subsidies per liter in US dollar cents in Angola were 15 and 28, respectively.

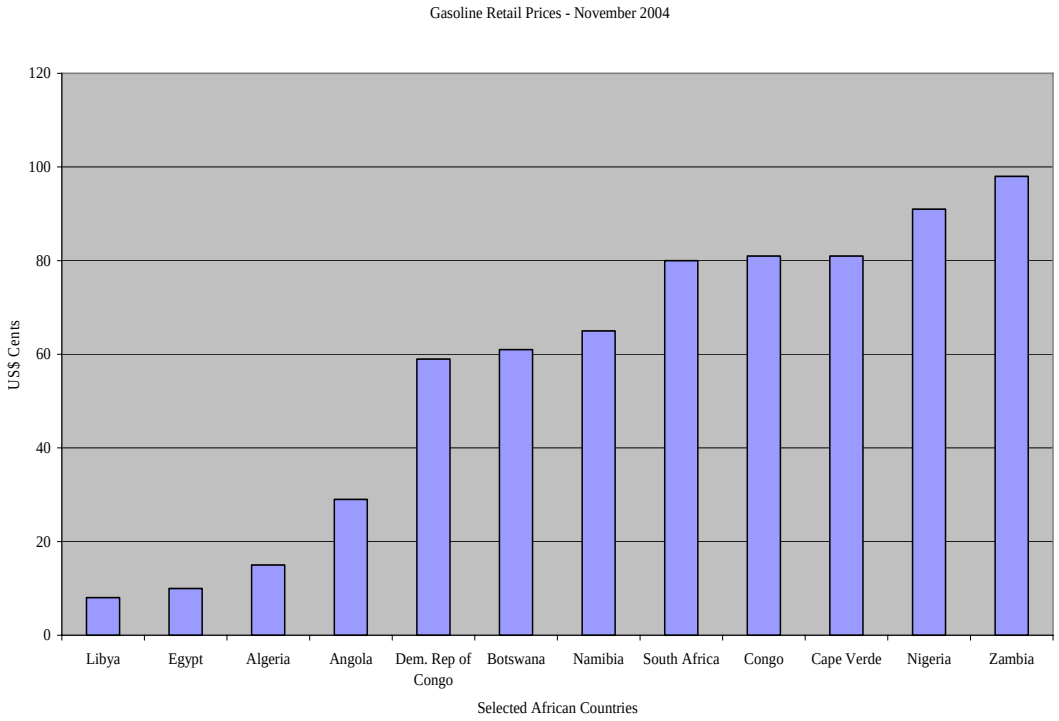

Figure 1

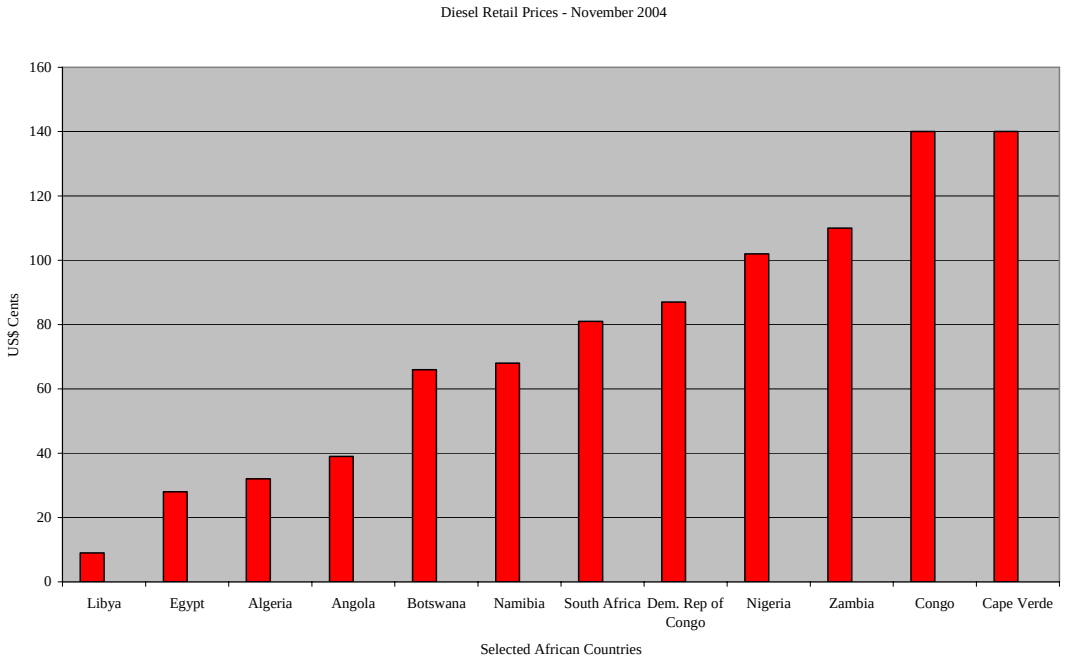

Figure 2

9. Fuel subsidization is common practice not only in Angola, but in many other oil rich countries, such as Iraq, Iran, Saudi Arabia, Libya, Egypt, Algeria, Indonesia, Malaysia, Venezuela and Bolivia. In November 2004, gasoline (gasoline subsidy) and

diesel (diesel subsidy) retail prices in US dollar cents per liter in these countries were respectively: (i) 3 (51) and 1 (56) in Iraq; (ii) 9 (45) and 2 (55) in Iran; (iii) 24 (30) and 10 (47) in Saudi Arabia; (iv) 9 (45) and 8 (49) in Libya; (v) 28 (26) and 10 (47) in Egypt; (vi) 32 (22) and 15 (42) in Algeria; (vii) 27 (27) and 18 (39) in Indonesia; (viii) 37 (17) and 22 (35) in Malaysia; (ix) 4 (50) and 2 (55) in Venezuela; and (x) 54 (0) and 27 (30) in Bolivia. As exemplified here, countries tend to subsidize diesel more heavily than gasoline.

10. Among other things, fuel subsidization proponents argue that fuel subsidies promote desirable and much needed transfers to poor households and keep transportation costs low. Both effects help poor households to afford consumption of some essential goods and services. Cheap fuels may enable poor households to cook, have lighting at home and utilize public transportation. During our interviews in Luanda, some Angolan public officials argued that fuel subsidies compensate the population for low salaries, lack of access to public services as well as for poor quality public service delivery.

11. Although these arguments have merit, based on international evidence that in many countries poor urban households spend relatively more of their budgets in consumption of kerosene than non-poor urban households and diesel is the main type of fuel utilized by public transportation operators,[1] international evidence also teaches us that large scale fuel subsidization may cause a number of serious macroeconomic problems, such as fiscal deficit crises,[2] losses in export revenues as well as rapid depletion of oil reserves due to excessive growth in domestic fuel consumption,[3] and exchange rate crises brought about by large levels of foreign capital flight, linked to foreign investors' pessimistic expectations about the given country's ability to control its fiscal finances.[4] Furthermore, there is also evidence that in some countries fuel subsidization yields higher overall benefits to the non-poor than to the poor population.[5]

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[1] Hope and Singh (1995) demonstrate that kerosene budget shares for the urban poor populations in Indonesia and Malaysia in the 1980s were higher than for their non-poor counterparts. They also show that in Ghana, in the 1980s, the average kerosene budget shares fell across consecutive quintiles from the second to the fifth quintile, indicating that the poor spends relatively more of their budgets in kerosene consumption.

[2] Hope and Singh (1995) show that fiscal deficit crises following external shocks (reductions in the prices of crude oil and raw materials) led to energy price hikes in Indonesia and Malaysia in the 1980s.

[3] Egyptian oil reserves, for example, are dwindling and the newly discovered oil fields do not have the same abundance as the older fields. In addition, since Egypt's long-standing fuel subsidization policy has encouraged large growth in fuel consumption, it may soon become a net importer of fuels (American Chamber of Commerce in Egypt, 2003). Malaysia also risks running out of oil reserves within 19 years (Metschies (2005)).

[4] On October 1, 2005, Indonesia nearly tripled kerosene and more than doubled diesel prices in order to signal to foreign investors its commitment to reduce subsidy expenditures and keep its fiscal finances under control. Large foreign capital flight in September 2005 caused the currency to plunge (see "Indonesia Triples Kerosene Prices to Cap Subsidies, Investments Magazine, October 1, 2005).

[5] Consider Iran, for example. We quote the following sentence from "Iran Medium Term Framework for Transition: Converting Oil Wealth to Development," Country Economic Memorandum, World Bank, April 30, 2003, p. iii: "Iran's indirect subsidy system, in particular, energy subsidies benefited the rich far more than the poor, sometimes by a 12 to 1 ratio."

12. It is, therefore, not surprising that many countries attempt to put an end to fuel subsidization policies.[6] Of particular interest are the Indonesian and Malaysian experiences with energy price hikes in the 1980s (see Hope and Singh (1995)). Both countries experienced fast economic growth in the 1970s and early 1980s largely because of rising oil prices. During these years, almost all of the commercial energy demands in these countries were met by petroleum products. Fuel prices were highly subsidized. Kerosene was widely used by households as a source of lighting, with poor urban households spending relatively more of their budgets with kerosene consumption than poor rural households – the latter had other energy-source options available. The negative external shocks faced by these economies in the mid 1980s led them to raise energy prices in order to mitigate fiscal deficit crises. The reforms in this sense were highly successful. The negative impacts of fuel price increases in overall production and inflation were small. Food production, for example, was hardly affected because it was not energy intensive.

13. Attempts to eliminate fuel subsidies, however, may be quite unpopular. In Indonesia, for example, protests motivated by an attempt to raise fuel prices in 1998 led to a series of events that culminated with the collapse of the regime presided by Suharto. Recent violent public protests against fuel price increases in Yemen left at least 12 Yemeni dead when the police exchanged fire with armed men in the capital and provinces (Metschies (2005)). Prices of diesel, gasoline, kerosene and LPG rose on July 19, 2005 by 166.67%, 78.95%, 200%, and 96.26%, respectively. On July 26, 2005, the Yemeni government retracted and cut fuel prices. Prices of diesel, gasoline and kerosene were cut by 25%, 8.82% and 25%, respectively. In Nigeria, a four-day general strike, initiated on October 11, 2004, was called by the Nigerian Labour Congress (NLC) as a protest against a 25% increase in fuel price. Banks, government offices, schools, hospitals, country factories, shops and filling stations throughout the country supported the strike (World Socialist Web Site, 22 October 2004).

14. Anticipating public opposition to energy price increases, authorities nowadays typically attempt to lower the incidence of public protests and social unrest by announcing various palliative measures, implementing a program of gradual price changes or delaying the price increases altogether. In Ghana, for example, in lieu of 50% fuel price increases in March 2005, governmental authorities promised to raise the minimum wage by 20%, reduce income taxes, abolish fees at public schools and build more low-cost houses.[7] In Indonesia, the government promised to cut the tariff on sugar imports by as much as 52% in November 2005.[8] In Malaysia, savings brought about by lower fuel subsidies are to be employed in the construction of schools, hospitals and public facilities (Metschies (2005)). Recent price adjustments tend to be gradual rather than abrupt because abrupt price changes in the past have led to political turmoil, revolts, and in the case of Indonesia, the overthrown of government. The population appears to

[6] On July 31, 2005, Malaysia decided to raise the unit prices of gasoline, diesel and LPG by 2.6, 5.3 and 1.3 US dollar cents, respectively (Metschies (2005)). The expected governmental savings range from US$ 1.7 to 2.0 billion in 2005 alone. Governmental officials plan to use the savings to build more schools, hospitals and public facilities.

[7] See "Ghana: Muted Protests to Government Hike in Oil Prices," IRINnews.org, March 4, 2005.

[8] See "Indonesia Triples Kerosene Prices to Cap Subsidies," Investments Magazine, October 1, 2005.

care more about the relative change in prices than the absolute change, with the likelihood of riots being higher for price changes exceeding 30% (Metschies (2005)).[9] Delay appears to be favored at times preceding elections. For instance, the price increases that took place in Ghana this year were much needed last year, but were nonetheless delayed because of December 2004 elections. Ghana's President John Kufuor was re-elected for a second four-year term.[10]

2. Fuel Subsidization in Angola

15. For a phasing out fuel subsidization strategy to work in Angola, one must pay close attention to the details of other countries' attempts of doing the same. However, one must also understand very well the peculiarities of the Angolan fuel pricing structure, the implications of the pricing structure for the formation of subsidy expenditures and the relationships between the world price of crude oil and each governmental expenditure and revenue. We address all these issues in this subsection, and in doing so, we shall provide answers to the following important questions: How does Sonangol operate as a distributor? What are Sonangol's operation costs? How much will the GoA save with the elimination of the subsidies? Are the savings obtained sufficiently large to compensate poor households and improve social protection?

16. An alternative to the rule described in the previous section to find out the level of fuel subsidization in Angola is to adopt Sonangol's official methodology. Using this formula, however, one realizes that fuel subsidies were enormous, sometimes exceeding actual prices by over 300% for gas, gasoline, diesel and kerosene.

Table 1: Administered Fuel Prices (2000-2004)

	Jan 2000		Feb 2000		Apr 2001		Aug 2001		Jan 2002		May 2004		Nov 2004	
Product	Kz	US$	Kz	US$	Kz	US$	Kz	US$	Kz	US$	Kz	US$	Kz	US$
LPG (kg.)	0.37	0.07	4.00	0.68	5.00	0.26	7.00	0.32	10.20	0.31	17.50	0.21	31.50	0.36
Gasoline (lt.)	0.26	0.05	4.00	0.68	5.40	0.28	8.20	0.38	12.00	0.37	20.00	0.24	34.00	0.39
Kerosene (lt.)	0.13	0.02	2.00	0.34	3.00	0.15	5.00	0.23	7.80	0.24	13.00	0.16	22.00	0.25
Diesel (lt.)	0.13	0.02	2.00	0.34	3.00	0.15	5.60	0.26	8.00	0.24	14.00	0.17	25.00	0.29
L. Fuel (kg.)	0.97	0.17	1.61	0.27	2.93	0.15	4.05	0.19	6.40	0.20	10.63	0.13	21.00	0.24
H. Fuel (kg.)	0.66	0.11	1.08	0.18	2.11	0.11	2.98	0.14	6.60	0.20	7.64	0.09	14.50	0.17
Asphalt (kg.)	0.61	0.11	1.01	0.17	2.00	0.10	2.83	0.13	4.50	0.14	7.50	0.09	13.50	0.16

Sources: Angolan Authorities and IMF Staff.

17. Prices of fuels were controlled throughout the period of study. From January 2000 to December 2004, there were six price adjustments – February 2000, April 2001, August 2001, January 2002, May 2004 and November 2004. Table 1 informs us about the adjusted prices in kwanza and dollar terms while Table 2 shows the percentage increase in fuel prices. Gas price increased by 981.08% and gasoline, kerosene and diesel prices all rose by 1438.46% in February 2000. The percentage price changes observed for these products in April 2001 and August 2001 were much smaller. Gasoline prices, for instance, increased by 35% and 51.85% during these months. The percentage price hikes

[9] According to Metchies (2005), p.82, "(t)his applies especially in Nigeria where fuel-price increases have repeatedly led to rioting, even though fuel had already become – viewed objectively – cheaper than drinking water."

[10] See "Ghana: Muted Protests to Government Hike in Oil Prices," IRINnews.org, March 4, 2005.

for gas, gasoline, kerosene and diesel in May 2004 and November 2004 were also much more modest than the ones that occurred in February 2000.

Table 2: Changes in Prices of Fuels Relative to Previous Month (%)

Product	Feb 00	Apr 01	Aug 01	Jan 02	May 04	Nov 04
LPG (kg.)	981.08	25.00	40.00	45.71	71.57	70.00
Gasoline (lt.)	1438.46	35.00	51.85	46.34	66.67	80.00
Kerosene (lt.)	1438.46	50.00	66.67	56.00	66.67	69.23
Diesel (lt.)	1438.46	50.00	86.67	42.86	75.00	78.57
L. Fuel (kg.)	65.98	81.99	38.23	58.02	66.09	97.55
H. Fuel (kg.)	63.63	95.37	41.23	21.48	15.76	89.79
Asphalt (kg.)	65.57	98.02	41.50	59.01	66.67	80.00

18. Tables 3 – 5 demonstrate how unit fuel subsidies are determined. Consider first the pricing structure adopted by Sonangol to calculate its proposed fuel prices. For gas, gasoline, kerosene and diesel 'total' prices are calculated from refinery prices by adding to these tax, operational cost, marketing cost and resale margin rates. As exemplified by Table 3, the refinery gas price was 6.15 kwanzas per kilogram in September 2000. Sonangol's total price per kilogram of gas was 10.21 kwanzas, value obtained from multiplying the refinery gas price by 1.66. The surcharge, 66%, can be broken down into the tax rate, 1%, the operational cost rate, 30%, the marketing cost rate, 10%, and the resale margin rate, 25%. Sonangol's total prices per liter of gasoline, kerosene and diesel were calculated from multiplying refinery gasoline, kerosene and diesel prices by 2.525, 1.56 and 2.05, respectively. For the other three fuel items, light fuel, heavy fuel and asphalt, Sonangol's total prices resulted from multiplying these products' refinery prices by 1.5. Total prices for these products do not include resale margins. Subsidies are obtained by subtracting actual prices from Sonangol's proposed prices.

Table 3: Structure of Costs and Margins - June 2003

Product	Refinery Price	Tax Rates	Operational Cost Rates	Marketing Cost Rates	Resale Margin	Total	Proposed Price	Actual Price	Subsidy
LPG (kg.)	31.33	1.00	30.00	10.00	25.00	52.01	52.00	10.20	41.80
Gasoline (lt.)	20.52	100.00	30.00	10.00	12.50	51.81	52.00	12.00	40.00
Kerosene (lt.)	20.32	1.00	30.00	10.00	15.00	31.70	32.00	7.80	24.20
Diesel (lt.)	14.00	50.00	30.00	10.00	15.00	28.70	29.00	8.00	21.00
L. Fuel (kg.)	15.60	10.00	30.00	10.00		23.40	23.40	6.40	17.00
H. Fuel (kg.)	10.56	10.00	30.00	10.00		15.84	16.00	6.60	9.20
Asphalt (kg.)	9.76	10.00	30.00	10.00		14.64	15.00	4.50	10.50

Source: Sonangol.

19. Sonangol's peculiar fuel pricing structure deserves a few comments. First, unit subsidies include unit taxes paid to the government. If we were to exclude tax rates from the calculations, total prices in September 2000 would have been: (i) 10.15 kwanzas per kilogram of gas; (ii) 6.15 kwanzas per liter of gasoline; (iii) 5.82 kwanzas per liter of kerosene; (iv) 4.27 kwanzas per liter of diesel; (v) 4.28 kwanzas per kilogram of light fuel; (vi) 2.90 kwanzas per kilogram of heavy fuel; and (vii) 2.69 kwanzas per kilogram

of asphalt. Given the actual prices paid by consumers, the unit subsidies would have been: (i) 6.15 kwanzas per kilogram of gas; (ii) 2.15 kwanzas per liter of gasoline; (iii) 3.82 kwanzas per liter of kerosene; (iv) 2.27 kwanzas per liter of diesel; (v) 2.67 kwanzas per kilogram of light fuel; (vi) 1.82 kwanzas per kilogram of heavy fuel; and (vii) 1.68 kwanzas per kilogram of asphalt. Hence, unit subsidies net of taxes would have been 1% lower for gas, 65.21% lower for gasoline, 9.48% lower for kerosene and 37.64% lower for diesel. Since diesel, gasoline and kerosene were, in this order, the most important fuel items in terms of consumption magnitude in Angola during 2000-2004, these findings suggest that government expenditure figures, such as subsidy expenditure and transfer payments, included taxes, were highly exaggerated.

Table 4: Structure of Costs and Margins - January 2004

Product	Refinery Price	Tax Rates	Operational Cost Rates	Marketing Cost Rates	Resale Margin	Total	Proposed Price	Actual Price	Subsidy
LPG (kg.)	38.94	1.00	30.00	10.00	25.00	64.64	64.60	10.20	54.40
Gasoline (lt.)	25.51	100.00	30.00	10.00	12.50	64.41	64.40	12.00	52.40
Kerosene (lt.)	25.25	1.00	30.00	10.00	15.00	39.39	39.40	7.80	31.60
Diesel (lt.)	17.40	50.00	30.00	10.00	15.00	35.67	35.70	8.00	27.70
L. Fuel (kg.)	19.38	10.00	30.00	10.00		29.07	29.10	6.40	22.70
H. Fuel (kg.)	13.12	10.00	30.00	10.00		19.68	19.70	4.60	15.10
Asphalt (kg.)	12.13	10.00	30.00	10.00		18.20	18.20	4.50	13.70

Source: Sonangol.

20. Second, unit subsidies rise whenever refinery prices grow faster than actual prices. Tables 3 and 4 illustrate this point. Between June 2003 and January 2004, refinery prices for all fuel items rose, but actual fuel prices did not change. Refinery prices grew by: (i) 24.29% for gas; (ii) 24.32% for gasoline; (iii) 24.26% for kerosene; (iv) 24.29% for diesel; (v) 24.23% for light fuel; (vi) 24.24% for heavy fuel; and (vii) 24.28% for asphalt. Subsequently, Sonangol's proposed prices grew by roughly equivalent amounts. Since actual prices did not change, unit subsidies also increased by the same rates as proposed prices.

Table 5: Structure of Costs and Margins - October 2004

Product	Refinery Price	Tax Rates	Operational Cost Rates	Marketing Cost Rates	Resale Margin	Total	Proposed Price	Actual Price	Subsidy
LPG (kg.)	59.07	1.00	30.00	10.00	25.00	98.06	98.10	17.50	80.60
Gasoline (lt.)	38.69	100.00	30.00	10.00	12.50	97.69	97.70	20.00	77.70
Kerosene (lt.)	38.31	1.00	30.00	10.00	15.00	59.76	59.80	13.00	46.80
Diesel (lt.)	26.39	50.00	30.00	10.00	15.00	54.10	54.10	14.00	40.10
L. Fuel (kg.)	29.40	10.00	30.00	10.00		44.10	44.10	10.63	33.47
H. Fuel (kg.)	19.90	10.00	30.00	10.00		28.90	28.90	7.64	21.26
Asphalt (kg.)	18.41	10.00	30.00	10.00		27.60	27.60	7.50	20.10

Source: Sonangol.

21. Third, Sonangol's pricing structure finds support on executive decree number 23/90 of September 28, 1990, signed by president José Eduardo dos Santos. Among other things, the decree establishes the rules governing refinery prices, incidence of taxes (50%

to be paid by the refinery and 50% to be paid by Sonangol) and grants Sonangol a 50% margin over refinery prices (plus taxes) in order to cover Sonangol's operational costs and guarantee both the enterprise's profitability and the standardization of fuel prices in the entire nation.

22. Fourth, the operational and marketing cost rates used in Sonangol's formula may result from either interregional or intraregional cross-subsidization. Mostly due to the ubiquitous precarious road conditions, operational costs faced by Sonangol vary significantly across regions. According to information we obtained during our interview at Sonangol, the operational marginal costs faced by the firm to deliver fuels in Moxico and Lobito, for example, are 69% and 79%, respectively. By contrast, the firm's operational marginal cost to deliver fuels in Bié is only 5.6%. However, we also found out that marketing cost rates for Lobito, Moxico and Bié are 3.2%, 1.8% and 0.9%, respectively – hence, rates much lower than the 10% rate used in Sonangol's pricing structure. The lower than official marketing costs may then partially compensate Sonangol for incurring higher than official operational costs in Moxico and Lobito (intra-firm cross-subsidization) and the lower than official operational and marketing costs in Bié may be financing higher than official operational and marketing costs elsewhere in Angola (interregional cross subsidization), such as in Moxico and Lobito.

23. Fifth, the generous margins awarded to Sonangol to establish its proposed fuel prices may be compensating the firm for expenditures incurred in areas other than fuel distribution operated by the firm or its various subsidiaries.[11] Such multitasking activities may spring operational inefficiencies, which in turn may reduce the firm's incentive and ability of investing in the fuel distribution network.[12]

24. The most important figures for the purposes of our analysis have been aggregated into annual amounts and collected in Table 6 below. Oil tax revenue was the main source of tax revenue and subsequently of government revenue during 2001-2004, since non-tax revenue is relatively unimportant – this fact is very visible in Figure 3. Of total revenue, oil tax revenue accounted for 80.63% in 2001, 76.92% in 2002, 75.22% in 2003 and 77.83% in 2004. Oil tax revenue grew by 75.26% from 2001 to 2004. During the same period, total revenue grew by 81.57%.

Table 6: Government Operations (US$ Millions)

Revenues & Expenditures	2001	2002	2003	2004
Oil Tax Revenues	3,186	3,308	3,888	5,585
Total Tax Revenues	3,925	4,256	5,104	7,108
Total Revenues	3,952	4,301	5,169	7,175
Subsidies	341	392	659	1,286
Transfers	512	529	979	1,673
Total Expenditures	3,309	4,239	5,195	6,178

Source: Ministry of Finance.

[11] See Pastor et al. (2003) for a description of the various activities undertaken by Sonangol.

[12] In Appendix IIA, we demonstrate that refinery prices for gasoline, kerosene and diesel were closely related to world prices for these fuels, since prices of oil refined products in Angola and the rest of the world were strongly and positively related to the world price of crude oil.

25. Subsidy expenditure was the main source of expenditure within the umbrella of governmental transfer payments. Of total transfer payments, subsidy expenditure accounted for 66.57% in 2001, 74.09% in 2002, 67.31% in 2003 and 76.86% in 2004. Between 2001 and 2004, subsidy expenditure expanded by 377%. As subsidy expenditure amounted to US$1.286 billion in 2004, the savings to be had with the complete elimination of subsidies are tremendous! Clearly, there would be enough resources to compensate poor households for increased burdens associated with higher fuel prices.

26. During 2001-2004, the growth in transfer payments was of 186.74%. Transfer payments also became relatively more important within the group of governmental expenditures as time progressed, increasing its participation rate in total expenditure from 15.48% in 2001 to 27.08% in 2004. While transfer payments expanded by 326.55% from 2001 to 2004, total governmental expenditure rose by 186.74% during the same period. See Figure 4 for visible yearly comparisons among these three expenditure figures.

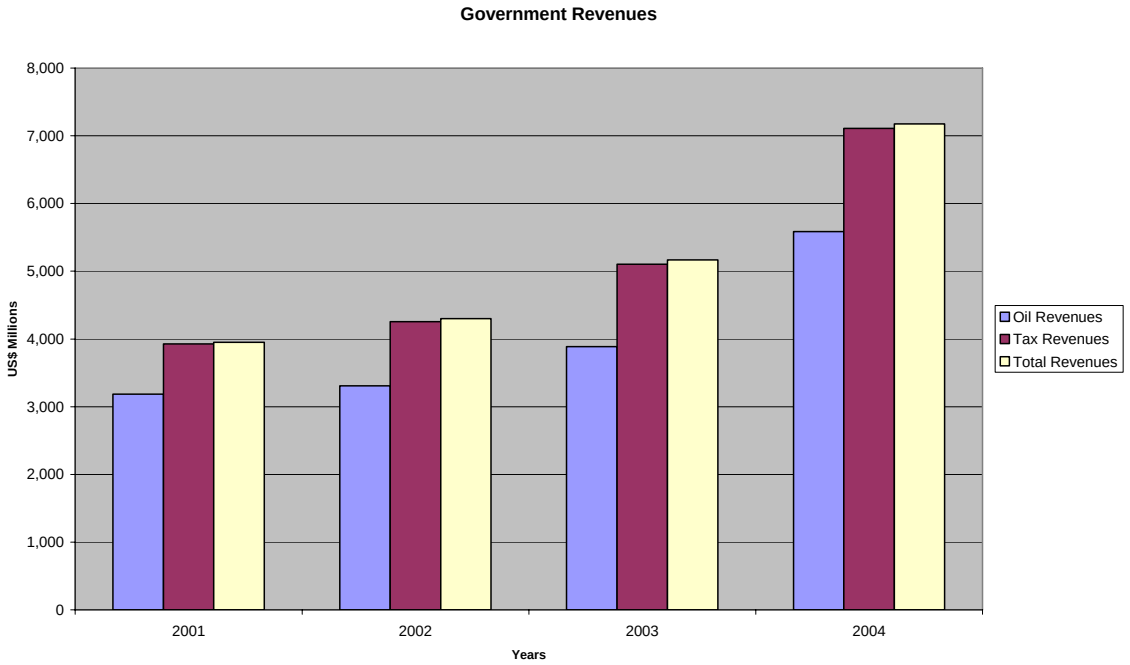

Figure 3

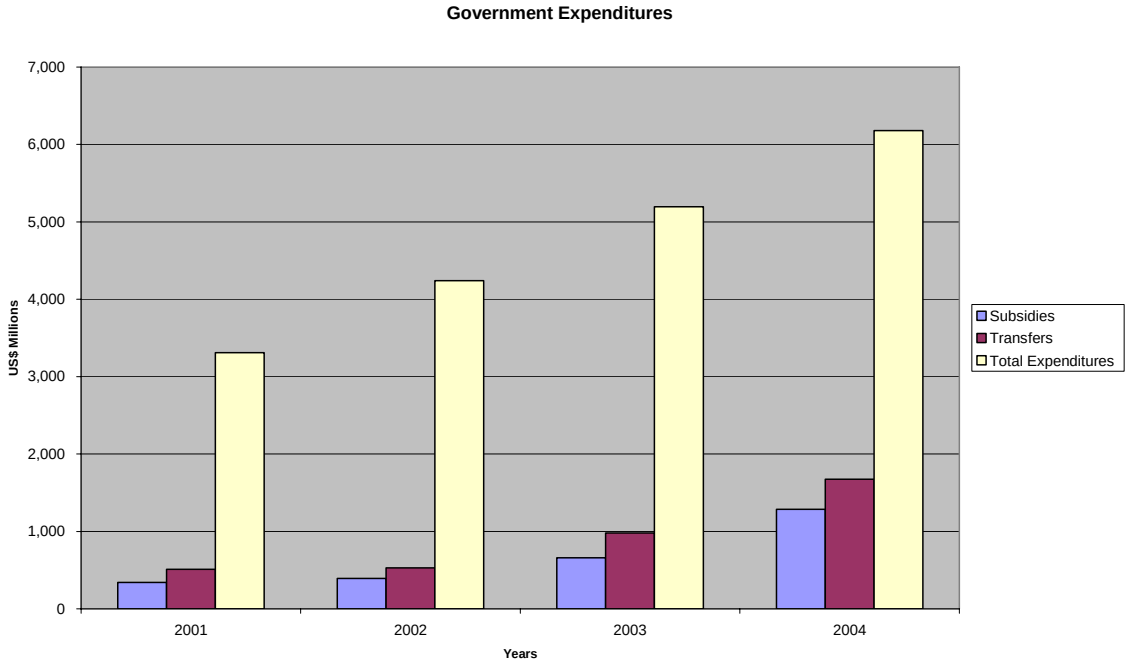

Figure 4

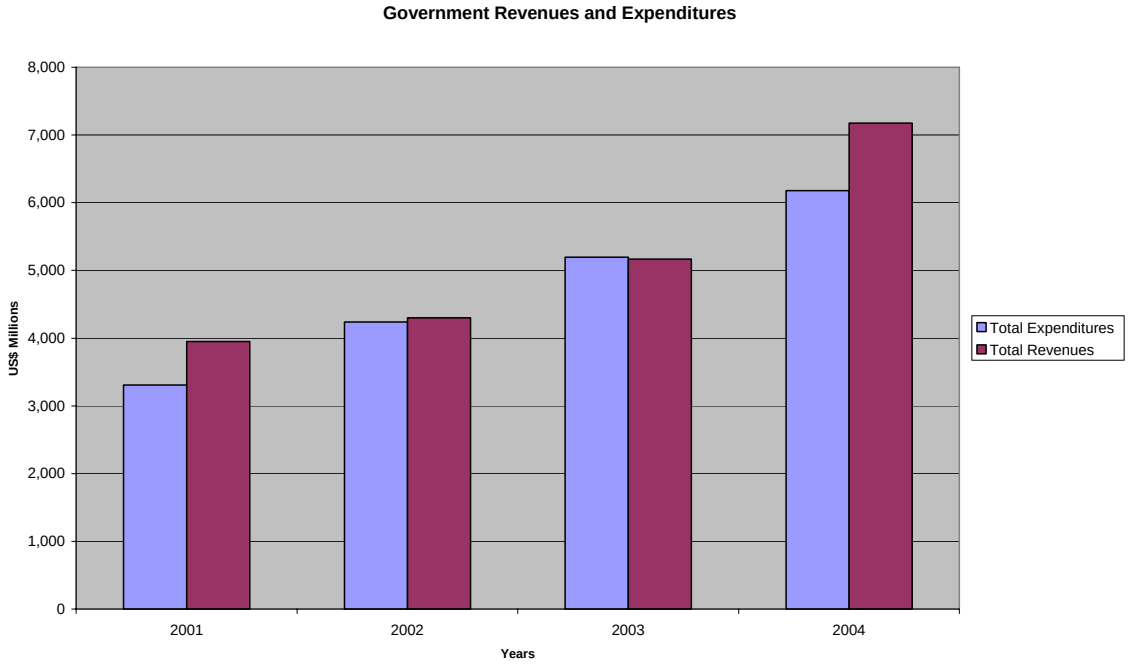

Figure 5

27. Table 6 also reveals that total revenue and expenditure figures were almost identical in 2002 and 2003. Total revenue exceed total expenditure by about US$62 million in 2002 and total expenditure surpassed total revenue by about US$26 million in 2003. As for the other two years, total revenue exceeded total expenditure by relatively

large amounts, about US$643 million in 2001 and US$997 million in 2004. One of the key implications of these recent developments is that the Angolan fiscal deficit declined from 7.9% of GDP in 2003 to 4.6% of GDP in 2004 (IMF. (2005)).[13] Figure 5 illustrates the evolutions of total revenue and expenditure figures during 2001-2004.

28. Governmental revenue and expenditure operations that are tightly related to the petroleum industry demonstrated tremendous annual growth throughout the period – see Figure 6. Oil tax revenue, subsidy expenditure and transfer payments, respectively, grew by 3.81%, 15.03% and 3.36% from 2001 to 2002, 17.54%, 68.04%, 84.96% and from 2002 to 2003 and 43.64%, 95.04% and 70.82% from 2003 to 2004.

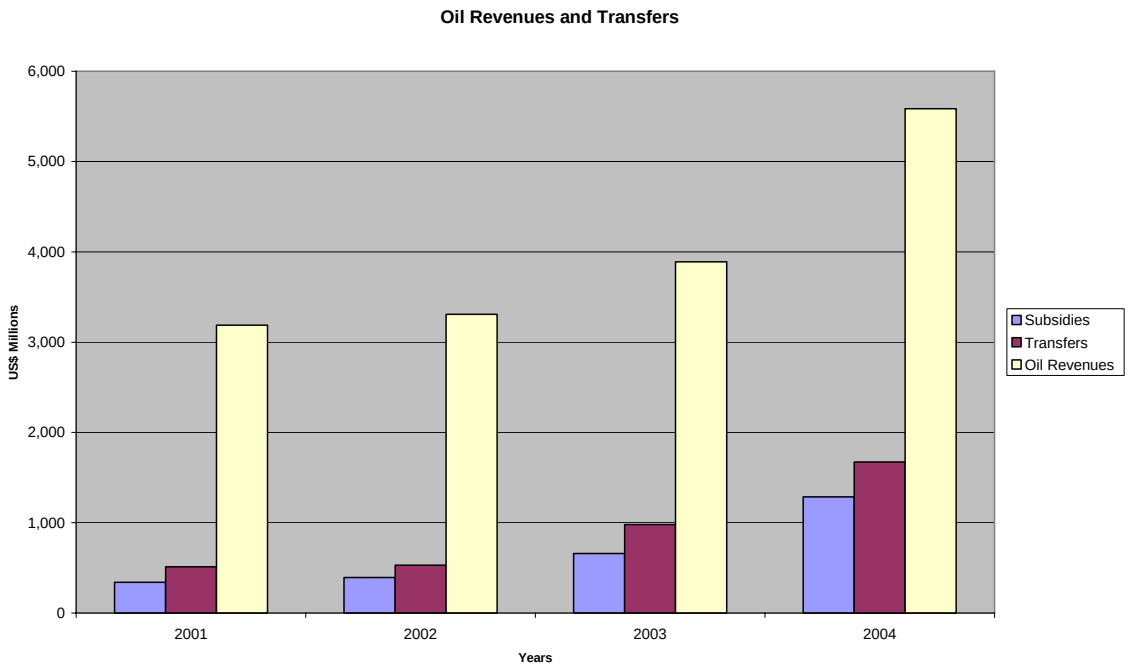

Figure 6

29. Another phenomenon that may positively contribute to both governmental revenue and expenditure growth is inflation. As costs of production are adjusted due to inflationary pressures, domestic prices of all goods and services, including those provided by the public sector, should eventually rise. The adjustments in administered fuel prices during 2001-2004 may have been partly motivated by the occurrence of high inflationary periods preceding the adjustments. Testing the hypothesis that governmental revenue and expenditure grow with inflation, as well as with the world price of crude oil, we now find that a 10% increase in the world price of crude oil expands: (i) oil tax revenue by 5.45%; (ii) total tax revenue by 4.94%; (iii) total revenue by 4.82%; (iv) subsidy expenditure by 17.66%; and (v) transfer payments by 19.17%. We also see that a 10% inflation rate yields increases of: (i) 1.82% in oil tax revenue; (ii) 2.17% in total tax revenue; (iii)

[13] The fiscal deficit as a fraction of GDP has fallen considerably since 1999, when the figure was 16.7% (see, e.g., Relatório Económico de Angola 2003).

2.21% in total revenue; (iv) 2.89% in subsidy expenditure; (v) 2.65% in transfer payments; and (vi) 2.88% in total expenditure. See Table A12.

2.1 Electricity Subsidization in Luanda

30. In this section we address the issue of electricity subsidization and answer the following questions: How problematic is the policy of subsidizing electricity provision in Luanda? What are the inefficiencies associated with public provision of electricity?

31. The electricity sector's infrastructure following the civil war is inadequate to produce electricity supply at a sufficiently high level to meet the demand in Luanda. Approximately 70% of the electricity supplied in Angola is consumed in Luanda.[14] The province is serviced by two state power companies, Empresa de Distribuição de Electricidade de Luanda (EDEL) and Empresa Nacional de Electricidade (ENE). Of total electricity supply in Luanda, EDEL and ENE account for 93% and 7%, respectively. In 2002, most of the electricity produced was consumed in residences (57%), followed by the industrial sector (23%), the service sector (18%) and the agricultural sector (2%). In that same year, EDEL estimated that there were 132,000 connections to the grid, being 102,000 registered customers and 30,000 illegal ones (i.e., non-metered connections). This represented an overall growth in total connections of about 9% relative to 2001, since in 2001 there were 100,000 legal and 21,000 illegal connections. In 2003, EDEL estimated to service 150,000 connections, of which 80% were residential.[15] A clear as well as visible indication that supply is insufficient to meet demand is the widespread use of diesel-powered generators in Luanda in both residences and businesses. Furthermore, it is estimated that 20% of the population in Angola has access to electricity. However, if the population currently residing in Luanda lies somewhere in between 3 and 4 million, as INE officials seem to believe, and about 80% of the electricity service supplied is residential, there would be only about 4% of Luanda's population with access to electricity. This figure seems to be too low. It is thus likely that EDEL's estimates concerning total connections are extremely conservative.

32. EDEL faces large technical and non-technical losses. Of total electricity supply generated, it is estimated that technical and non-technical losses represent 15% and 21%, respectively. Technical losses are in great part due to damages caused to the grid system during the war. Non-technical losses originate from the lack of metering systems, inefficient billing and settlement systems and illegal connections. In 2001, EDEL suffered a financial loss of Kz 337 million. Its revenues were Kz 399 million from sales, Kz 238 million from governmental subsidy transfer and Kz 8 million from other sources. Its costs originated from Kz 675 million spent on purchasing power from ENE, and Kz 306 spent on other sources.

33. Presumably, the rationale for the governmental subsidy transfer has to do with EDEL's inability of raising sufficiently high revenue from sales to meet its costs. This

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[14] See "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005. Much of the information contained in this subsection is taken from this report.
[15] See "Angola Energy Sector Needs Assessment: Emergency Response Study," Nexant, August 2003.

phenomenon has not only been the product of EDEL's inefficiencies in properly metering, billing customers for service delivered and preventing the surge in illegal connections, but also of the fact that electricity prices have been set by the Ministry of Finance at levels below the long run marginal cost, affirmed to be US$0.11 per kWh.[16] In January 2000, the electricity price per kWh was US$0.009. During January 2000 – December 2004, there were eight changes to electricity prices: March 2000 (US$0.08); May 2000 (US$0.09); April 2001 (US$0.05); November 2001 (US$0.06); September 2002 (US$0.07); November 2002 (US$0.08); February 2003 (US$0.04); and May 2004 (US$0.04).[17] As in between adjustment periods, prices were fixed in kwanza terms, it is safe to conclude that the electricity price per kWh set by the Ministry of Finance was below the long run marginal cost figure cited above throughout the studied period.

3. Water Subsidization in Luanda

34. In this section, we provide answers to the following questions. How problematic is the policy of subsidizing water service provision in Luanda? Are there secondary markets (resale) for water? If so, how do they operate and what is the price premium charged? How does the distribution mechanism work? Are there unofficial intermediaries? What are the inefficiencies associated with public provision of water services?

35. Empresa Pública de Águas de Luanda (EPAL) is the largest water company in Angola. It is in charge of treating and distributing water in Luanda. The sewerage system, comprising sewage and storm water, is administered by Luanda's provincial government. Although EPAL became a public enterprise in October 2001, it was not given full powers to hire and fire public officials, and it was given control over water tariffs. Prices charged for piped water are set by the Ministry of Finance. As official water prices are set below cost-recovery levels and as, in the case of EDEL, there are significant losses promoted by inefficiencies in billing, collections and illegal connections to the water network, EPAL's survival is largely dependent on governmental subsidy transfers. We will present subsidy transfer amounts in 2002 below.

36. Due mostly to migratory movements motivated by the civil war, Luanda's population is estimated to have more than doubled between 1990 and 2002, growing from 1.6 million to 3.6 million. It is also estimated that nearly 80% of Luanda's population resides in peri-urban areas. There are striking differences in terms of available infrastructure between central and peri-urban areas. The latter are typically characterized by poor housing and low quality public services (roads, water, sanitation and electricity). In the next section, we will present evidence that supports this claim – namely, our survey's results concerning the sampled population's perceptions about public service quality levels.

37. In 2001, EPAL's water treatment capacity (255,000 cubic meters per day) could in principle (zero losses) yield average consumption of 72 liters per capita per day.

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[16] See "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005.
[17] Data provided by Angolan authorities.

However, due to technical problems, power shortages, etc., the actual production was only about two thirds of capacity (165,500 cubic meters per day). Substantial losses in distribution meant that less than 40% of the amount produced reached piped water consumers (64,000 cubic meters per day). As some of such consumers were not registered (illegal connections), EPAL's ability of raising revenue from water sales was seriously hampered.

38. Most of the population that resides in peri-urban areas does not have access to piped water. Although a few households obtain water from rivers and wells, the bulk of the population residing in peri-urban areas is typically supplied with water distributed by public taps (kiosks) and water trucks. Water purchased from water trucks is frequently stored in tanks by households, many of whom later resell to their neighbors. The vertical structure of the secondary water market may involve two layers of intermediaries, water truck operators and water tank owners.

39. In 2001, the total water supplied by these sources other than EPAL was estimated to add about 18,000 cubic meters of water per day to the piped water amount, yielding a total of 82,000 cubic meters of water per day. This total entailed an average consumption of less than 20 liters per capita per day, calculated from a weighted average of 34 liters per capita per day in the piped water areas (servicing about 1.3 million people) and 10 liters per capita per day in the area not serviced by piped water (supplying approximately 2.3 million people).[18] The unequal access to piped water implies that households who rely heavily or entirely on water purchased from private providers end up paying 10 to 20 times as much as households who have access to piped water, on a monthly basis, and consume around 70% less water per capita.

40. As for the financial losses faced by EPAL, the following quote taken from "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005, p. 63, is very revealing:

> "The losses in EPAL's physical distribution system are mirrored in the financial realm by low billing levels (only 52 percent of the supplied water is billed to 149,000 customers), and an even lower collection rate (44 percent of the invoiced amount). This implies an effective revenue generation from only 23 percent of the water supplied. The largest debtors are government agencies and state enterprises."

41. According to figures made available by EPAL, in 2002, of the water distributed, 42% was billed, but only 25% was actively sought to be collected and total losses accounted for about 73.5%.[19] Also according to EPAL figures, in 2002, collected US$3.581 million from water sales and US$0.865 million from other services provided, but incurred costs of US$10.456 million, of which US$3.341 million resulted from payments of salaries and employee benefits. To cover the financial loss of about US$6

[18] See "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005.
[19] See "Plano Estatégico 2003-2005," Empresa Pública de Águas (EPAL), Angola, 2003.

million, the company received price and operational subsidy amounts of about US$ 7.444 million and US$0.941 million, respectively.

III. INCIDENCE OF SUBSIDIES AND PERCEPTIONS OF PUBLIC SERVICE PROVISION

42. Who benefits from fuel and utility subsidization? How does the population perceive the importance and qualities of public services? This section answers these two apparently unrelated questions. We first provide information about the incidence of subsidies by income groups in Luanda, and later examine the characteristics of the various segments of the population affected by subsidies. By doing this, we will be able to answer the following important questions: Which segments of the population will be directly and indirectly through rising transportation and input costs affected by rising fuel prices? Which energy sources do urban and rural households typically use for lighting and cooking? How accessible are the fuels for the poor? How substitutable are the fuels for the different types of consumers?

43. If one rationalizes the existence of fuel and utility subsidization by arguing that it is essentially a public transfer intended to compensate the population for the provision of low quality public services, the issues of subsidy incidence and consumption benefits from publicly provided services are intricately related. As we mentioned in the previous section, this compensation argument is supported by some governmental officials, according to the feedback we received during our interviews and workshop presentations in February, June and October, 2005. To have any merit at all, however, this argument would also have to be supported by strong empirical evidence that those who benefit the least from public service provision are exactly those who benefit the most from fuel and utility subsidization, since the public transfers should be inversely related to household benefits from consumption of public services.

44. We start our analysis by profiling those households who benefit from fuel and utility subsidization, and later examine both the revealed public perceptions about public service provision, and household choices made when faced with public service and commodity access difficulties and poor quality service delivery. The profile of a benefited household takes the following characteristics into account: (i) its income; (ii) its asset possessions; (iii) its residential locality; (iv) its type of residence; (v) its difficulty in accessing consumption of fuels and utilities; (vi) its difficulty in accessing consumption of educational and health services; and (vii) whether or not it incurs expenses in education, health and public transportation.

45. To profile according to income, we compute fuel and utility budget shares for the average individual in the whole sample as well as for the average individual within each quintile. We also estimate the relationship there may exist between each fuel and utility budget share and income. In these exercises, we will include food budget shares for

comparison purposes. To profile according to the other characteristics cited above, we utilize statistical analysis to identify large fuel and utility demanders according to the described characteristics. These are the households who derive greater than average benefits from fuel and utility consumptions.

46. Per capita household expenditure on goods and services is our measure of per capita household income. Table 7 displays some descriptive statistics for water, gas, kerosene, gasoline, coal, diesel, electricity, food, public transportation, health care and education budget shares. Of her total income, the average individual in the whole sample spends 4.17% in water, 5.74% in gas, 1.30% in kerosene, 1.64% in gasoline, 0.68% in coal, 0.28% in diesel, 3.04% in electricity, 41.52% in food, 5.17% in public transportation, 7.47% in health care and 8.05% in education.[20] Note that the water, gas, kerosene, coal, electricity and budget shares for the fifth quintile are smaller than their counterparts for the first quintile. For water, gas and kerosene, budget shares fall from each consecutive quintile, starting with the first. For coal, it rises from the first to the second quintile, falls consecutively from the second to the fourth quintile and then rises from the fourth to the fifth quintile. For electricity, the budget share falls from the first to the second quintile, rises consecutively from the second to the fourth quintile and then falls from the fourth to the fifth quintile. The largest drop in budget share occurs for kerosene, changing from 2.26% at the first quintile to 0.42% at the fifth quintile.

47. Regarding relative expenditures in public services, we see that the budget shares for the fifth quintile are larger than their counterparts for the first quintile. Education budget share rises consecutively from the first to the fifth quintile. This pattern may be capturing some well known facts about household educational expenditures in developing countries – children from poor households are more likely not to attend school and children from high income households are more likely to attend private schools.[21] Public transportation and health care budget shares rise consecutively from the first to the third quintile and then fall from the third to the fourth quintile. While public transportation budget share falls again from the fourth to the fifth quintile, health care budget share rises from the fourth to the fifth quintile. According to our survey responses, most of the interviewed households walk rather than use public transportation when they wish to go anywhere and of those who use public transportation, the vast majority use van rather than bus services. Hence, a possible explanation for the public transportation budget share pattern is that households within the first quintile use public transportation less frequently than households within the other quintiles, medium income households (those who are within the second, third and fourth quintiles) are more likely to utilize van service than households within the first and fifth quintiles and households within the fifth quintile are more likely to utilize automobiles as their preferred transportation mode than

[20] A study of the impacts of fuel price increases in Nepal, "Socio-Economic Impact of Fuel Price Increases in Nepal," reported similar household budget shares for kerosene and electricity. As for the gas budget shares, rather than the declining tendency of the gas budget share as a function of quintile we observe in Table 8, in Nepal gas budget shares as a function of quintile show an inverted-U tendency rising from the first to the third quintile and then falling from the third to the fifth quintile. The third quintile's budget share is 7%.

[21] In fact, figures from the Ministry of Education and Culture indicate that Angola's primary school gross enrollment rate is 54 percent (about 1.1 million students in grades 1- 4 and 213,000 in grades 5 - 6)

households within the other quintiles and also more likely to use public transportation than households within the first quintile. We should then expect that the highest burdens associated with rising fuel prices in what regards the indirect effect transmitted through higher public transportation fares will be borne by medium income households. As for the pattern seen for health care budget share, we claim that better health care services at health centers are given to those who can better afford them, since according to information we received during our last workshop presentation to civil society groups, all services dispensed at health centers are essentially privatized.

Table 7: Budget Shares
Descriptive Statistics

	Total Sample	First Quintile	Second Quintile	Third Quintile	Fourth Quintile	Fifth Quintile
Commodities	Mean (S. D.)	Mean (S. D.)	Mean (S. D.)	Mean (S. D.)	Mean (S. D.)	Mean (S. D.)
Water	0.0417	0.0564	0.0430	0.0402	0.0414	0.0287
	(0.0600)	(0.0891)	(0.0496)	(0.0580)	(0.0549)	(0.0334)
LPG	0.0574	0.1297	0.0578	0.0426	0.0350	0.0292
	(0.1219)	(0.2371)	(0.0925)	(0.0425)	(0.0688)	(0.0372)
Kerosene	0.0130	0.0226	0.0173	0.0110	0.0107	0.0042
	(0.0352)	(0.0532)	(0.0380)	(0.0265)	(0.0320)	(0.0144)
Gasoline	0.0164	0.0191	0.0153	0.0130	0.0150	0.0199
	(0.0560)	(0.0921)	(0.0431)	(0.0386)	(0.0460)	(0.0485)
Coal	0.0068	0.0086	0.0093	0.0054	0.0045	0.0064
	(0.0325)	(0.0321)	(0.0483)	(0.0249)	(0.0218)	(0.0289)
Diesel	0.0028	0.0024	0.0018	0.0023	0.0025	0.0051
	(0.0185)	(0.0253)	(0.0140)	(0.0150)	(0.0144)	(0.0218)
Electricity	0.0304	0.0431	0.0283	0.0287	0.0309	0.0221
	(0.0716)	(0.1166)	(0.0811)	(0.0588)	(0.0493)	(0.0260)
Food	0.4152	0.4393	0.4331	0.4307	0.3934	0.3819
	(0.2213)	(0.2854)	(0.1954)	(0.2093)	(0..2047)	(0.2023)
Public Transportation	0.0517	0.0376	0.0600	0.0613	0.0549	0.0430
	(0.0688)	(0.0534)	(0.0730)	(0.0759)	(0.0704)	(0.0647)
Health Care	0.0747	0.0455	0.0762	0.0850	0.0789	0.0851
	(0.0846)	(0.0769)	(0.0853)	(0.0891)	(0.0801)	(0.0850)
Education	0.0805	0.0544	0.0596	0.0747	0.0914	0.1201
	(0.105)	(0.0811)	(0.0879)	(0.0846)	(0.1137)	(0.1338)

48. For all quintiles, gas and diesel are the fuels that command the highest and lowest budget shares, respectively. It is also interesting to note that the gasoline and diesel budget shares initially fall but then rise as we move from the first quintile toward the fifth quintile. Indeed, the gasoline budget share for the fifth quintile is larger than the one for the first quintile and the diesel budget shares for the fourth and fifth quintiles are larger than the one for the first quintile. This phenomenon may be explained by the fact that well-off households are more likely to own automobiles as well as to utilize gasoline- or diesel-fueled generators as supplementary sources of energy.

49. The descriptive statistics above suggest mixed relationships between budget shares and expenditure, negative for utilities, gas and kerosene and positive for education,

health care and public transportation. The hypothesis that budget shares of essential goods and services should decline with income is deeply rooted in microeconomic analysis of consumer behavior, since poor households should spend a proportionately larger portion of their incomes in consumption of such goods and services than better off households.[22] As household income rises, households can afford consumption of non-essential goods and services. The microeconomic theory of fertility also teach us that education budget shares should rise with income as richer households are more inclined than poor households to view children as "investment commodities" rather than "consumption commodities." According to this line of argument, medium to high income households tend to care more about quality than quantity when they make their choices about family size. They are thus more inclined to spend relatively more in educational services – sending their children to better quality schools and purchasing extra curricular educational services – than less privileged households.

50. With the exception of the statistical relationship between education budget share and income, we see in Table A65 that all other results indicate negative relationships between budget shares and income, providing thus support to the hypothesis that budget shares of essential goods and services decline with income. The lowest income responses, in absolute terms, are observed for food and education budget shares, respectively. That is to say, as income increases, the changes in food and education budget shares are lower than those for all the other budget shares considered. When considering these findings, one must not forget that food consumption includes consumption of essential and non-essential food items (e.g., luxurious foods such as prime beef) and education expenditure includes a gamma of expenditure items, ranging from expenditures on books and other school supplies to payments of matriculation and other fees at primary though tertiary private schools. Hence, the estimates of income response for food and education budget shares are not very surprising. Furthermore, the positive value for the estimate of income response for education budget share indicates that richer households spend relatively more with education than poor ones, supporting the hypothesis of positive relationship derived from the microeconomic theory of fertility.

51. As for the other important public service considered here, the estimate of income response for public transportation budget share, being low, implies that medium and high income households also benefit from public transportation services. As we discussed above, such benefits are very likely associated with usage of van service rather than bus service, since van service utilization is much larger than bus service utilization.

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[22] This hypothesis found empirical support in an earlier study of the effects of energy price increases in developing countries (Hope and Singh (1995)). The authors studied episodes of energy price increases in Colombia, Ghana, Indonesia, Malaysia, Turkey and Zimbabwe. The following excerpt taken from their study is especially noteworthy. "The case studies confirm an inverse relationship between income levels and energy budget shares, with higher-income households typically having lower energy budget shares than low-income households. Rural households tend to have a lower budget share for commercial energy as compared to urban households. This is expected, given rural access to non-commercial fuels such as agriculture waste and firewood. Urban low-income households were observed to have the highest budget shares for commercial energy. In absolute terms, the highest budget shares for kerosene lie between 3.6 and 6 percent. For electricity the relevant range is 1 to 9 percent." (pp. 3-4).

52. Although the largest income response is for coal budget share, the most striking result for our purposes pertains to the second largest income response, that for gas budget share, since gas consumption is widespread. We note that a 10% rise in household income leads to reductions of 6.30% and 6.39% in gas and coal budget shares, respectively. As we observed above, the gas budget share is large for the first quintile and it declines by substantial amounts as we move from the first toward the fifth quintile. Hence, the income response estimate captures these two facts.

53. We also mentioned above that kerosene presented the largest reduction in budget share as we moved from the first to the fifth quintile. However, its income response is the smallest among those for fuels and utilities – a 10% increase in income yields a 2.53% reduction in kerosene budget share. How can we explain this fact in light of our reasoning for the gas budget share's income response? Not only kerosene consumption is more concentrated than gas consumption, but it is also less frequent. Most of the households who consume kerosene are within the first and second quintile groups. Hence, as income rises, the reduction in kerosene budget share is weaker than in the case of gas budget share.

54. Among fuel and utility budget shares, the income response for water budget share is the lowest – a 10% increase in income leads to a 3.91% reduction in water budget share. This low response may be explained by the facts that there is widespread consumption of water sold by private providers, often at high prices, many poor households seem to favor consumption of water made available at public taps relative to alternative provision modes, that most of the population does not have access to water services provided by EPAL and that the quality of the water distributed by EPAL to the minority which has access to this service is generally poor due to contamination or leakage in the water distribution network. These facts may give rise to two phenomena that rationalize the low income response: (i) poor households, within first and second quintiles, are more likely to consume water from public taps than better off households; and (ii) better off households are more likely to purchase water from private providers.

55. Finally, we find that a 10% increase in income should lead to decreases of 4.73% and 4.22% in electricity and gasoline budget shares, respectively. These income response rate figures are situated within the middle of the fuel and utility income response rate figures. Gasoline expenditure appears to be relatively more important for households within the fifth quintile than for households within the other four quintiles because this energy source is highly used by well off households in the generation of lighting or to fuel their automobiles. The income response rate figure for gasoline budget share is then highly influenced by the behavior of households who have generators or who own automobiles. The profile of households who benefit from fuel and utility subsidization is described in Box 1 below.

Box 1: Profile of Households who Benefit from Utility and Fuel Subsidization

Water	Electricity	Gas	Gasoline/Diesel
• Average water purchasers of Cazenga, Sambizanga and Viana; • Homeowners and households who reside in large houses • households that primarily purchase water from water trucks and from small street vendors; • households who get water from neighboring residences; • households in which women are in charge of collecting water; • households that travel distances between 200 and 400 meters to fetch water; • households who frequently use coal and kerosene; • households who walk to school and to health centers • households who do not incur education expenses; and • households who incur public transportation expenses.	• Average electricity purchasers in Maianga, Samba and Sambizanga; • households who own refrigerators and computers; • households who reside in apartments; • households who consume water from home taps; • households in which male teens are in charge of collecting water • households that do not collect water; • households who frequently use generators; • households who use automobiles to go to school and to health centers; • households who take vans to go to health centers; • households who do not incur education expenses; and • households who do not incur public transportation expenses	• Average gas purchasers in Cacuaco and Kilamba Kiaxi; • households within the fifth quintile; • households who own automobiles; • households who reside in houses; • households in which female teens are the main water collectors; • households who travel less than 200 meters to fetch water; • households who frequently use coal but deem access to coal difficult; • households who frequently consume publicly provided electricity but deem access to this source difficult; • households who walk to health centers • households who do not incur education expenses and public transportation expenses; • households who do not incur health expenses.	Households who benefit from gasoline subsidization are the following higher than average gasoline demanders: • the average gasoline purchasers in Kilamba Kiaxi and Viana • households who frequently consume publicly provided electricity but deem access to this source difficult; and • households who walk to health centers. Households who benefit from diesel subsidization are the following higher than average diesel demanders: • the average diesel consumer in Kilamba Kiaxi; • households within the third quintile; and • households who do not incur health expenses.

Table 8: Public Services According to their Perceived Importance
(1 = Maximal; 7 = Minimal; %)

Services	1	2	3	4	5	6	7
Schools	92.29	3.15	1.82	0.77	0.70	0.35	0.91
Electricity	82.84	6.93	3.43	2.59	1.40	0.91	1.89
Roads	68.19	9.39	9.18	3.50	1.40	1.12	7.22
Health Center	86.19	7.01	2.80	2.10	0.56	0.70	0.63
Sewage	72.48	6.65	7.21	3.64	1.75	2.10	6.16
Home Tap Water	83.31	8.63	3.16	1.61	1.05	0.98	1.26
Pub. Transportation	76.30	7.10	2.70	2.34	1.77	2.27	7.52

56. We now examine the pieces of information revealed by households concerning their perceptions about importance and qualities of public services provided. Households were asked to rank public services according to their perceived importance as well as according to their satisfaction rates from service provision and the results of this consultation are summarized in Table 8. Schools, electricity provision, roads, health center services, sewage, home tap water service and public transportation are deemed as public services of maximal importance.

Table 9: Satisfaction Rates with Public Services
(1 = Maximal; 7 = Minimal; %)

Services	1	2	3	4	5	6	7
Schools	19.55	10.16	16.82	8.27	4.70	7.57	32.94
Electricity	12.46	6.72	9.10	12.46	6.02	9.87	43.35
Roads	6.74	3.58	4.28	9.89	8.42	11.16	55.93
Health Center	15.16	9.54	14.11	12.42	7.58	10.46	30.74
Sewage	8.63	2.18	5.89	8.91	5.89	7.16	61.33
Home Tap Water	18.79	5.89	6.10	11.43	5.12	9.05	43.62
Pub. Transportation	15.33	6.53	9.01	9.87	6.39	13.20	39.67

57. Turning now to satisfaction rates, we see a very dismal picture, whereby large percentages of the population surveyed agree that the services provided are of minimal satisfaction (Table 9). More than 50% of households declared to be minimally satisfied with roads and sewage. With the exception of satisfaction rates with schools, we see that the proportions of the population surveyed that claim to be maximally satisfied with public services, column 1, is less than half of the proportions that claim to be minimally satisfied, column 7. In sum, relatively few households enjoy the key services provided by public authorities, even though, relatively many households agree that these services are of maximal importance.

58. According to our interviews with public authorities and the views of some participants of the six workshops delivered in Luanda in 2005, the poor ratings received by public services are mainly the products of two facts, namely, widespread lack of access to public services and poor quality service delivery noticed by those few who have access to these services. Another fact that may contribute to the bad image given to publicly provided services is the existence of extra “fees” for services that should be provided free of charge. This is apparently the case with school and health center services.

59. Lack of access to public transportation or poor quality service delivery may also impair utilization rates of schools and health centers. In our survey, 1,042 households answered questions about transportation modes frequently used to go to school.

Table 10: Household Choices of Transportation to Schools and Health Centers

Household Choices to Go to Health Centers and Schools	Number of Respondents (Households)		Percentage of the Total	
	Schools	Health Centers	Schools	Health Centers
Walking	603	586	57.87	53.13
Vans	288	339	27.64	30.73
Automobiles	96	144	9.21	13.06
Buses	32	25	3.07	2.27
Other Modes	19	5	1.82	0.45
Bicycles	3	3	0.29	0.27
Motorcycles	1	1	0.10	0.09
Total	1,042	1,103	100	100

60. It is interesting to note that the most frequently used transportation mode to go to schools and health centers is walking, followed by van service and automobiles (see Table 10). Even though buses are the single public transportation mode subsidized by the government, they are rarely used.

61. Close inspection of some other data obtained in the survey confirms the views mentioned above that access difficulties and poor quality service delivery affect the various, if not all, choices made by households. The descriptions of household water and energy source utilization rates provided in Tables 11 – 13, for example, enable us to understand the choices made by households in light of the budgetary and logistical constraints they faced. The latter may impose high costs, since a large number of households find it very hard to have access to consumption of their most preferred water and energy sources. The data in Tables 11 – 13 are distributed across Luanda's nine municipalities, namely, Cacuaco (1), Cazenga (2), Ingombota (3), Kilamba Kiaxi (4), Maianga (5), Rangel (6), Samba (7), Sambizanga (8) and Viana (9). The bottom row of each table gives us the number of households interviewed in each municipality.

Table 11: Main Water Source Utilized

	Municipalities (Utilization Rates, %)								
Source	1	2	3	4	5	6	7	8	9
Home Taps	9.80	38.46	45.67	20.56	49.25	57.45	71.05	59.41	12.69
Public Taps	23.53	23.93	34.26	47.22	5.64	9.57	2.63	8.24	62.69
Wells	0.00	0.85	0.00	0.00	0.00	0.00	1.32	0.59	0.00
Water Trucks	54.90	18.80	14.53	27.22	36.09	9.57	14.47	18.82	14.18
Neighbor	10.78	6.84	4.50	5.00	8.27	21.28	9.21	7.65	1.49
Street Vendors	0.98	11.11	1.04	0.00	0.75	2.13	1.32	5.29	8.96
Observations	102	117	289	180	266	94	76	170	134

Table 12: Main Energy Source Utilized for Lighting

	Municipalities (Utilization Rates, %)								
Source	1	2	3	4	5	6	7	8	9
Electricity	47.06	59.83	65.74	59.44	91.35	92.55	92.11	98.24	42.54
Generator	8.82	5.98	8.65	2.22	4.14	2.13	3.95	0.59	5.22
Kerosene	41.18	26.50	24.91	35.00	2.63	2.13	1.32	0.00	47.01
Candle	2.94	7.69	0.69	3.33	1.88	3.19	2.63	1.18	5.22
Observations	102	117	289	180	266	94	76	170	134

Table 13: Main Energy Source Utilized for Cooking

	Municipalities (Utilization Rates, %)								
Source	1	2	3	4	5	6	7	8	9
Gas	90.20	85.47	95.16	90.00	95.86	94.68	97.37	98.82	86.57
Electricity	0.00	0.00	1.04	0.00	2.26	1.06	2.63	0.00	0.00
Kerosene	6.86	4.27	3.81	8.89	0.38	0.00	0.00	0.00	2.24
Coal	2.94	8.55	0.00	1.11	0.38	2.13	0.00	0.59	9.70
Do Not Cook	0.00	1.71	0.00	0.00	1.13	2.13	0.00	0.59	1.49
Observations	102	117	289	180	266	94	76	170	134

62. Table 11 informs us that the water sources with the largest utilization rates are: (i) water trucks in Cacuaco; (ii) home taps in Cazenga, Ingombota, Maianga, Rangel, Samba and Sambizanga; and (iii) public taps in Kilamba Kiaxi and Viana. Public taps have the second largest utilization rates in Cacuaco, Cazenga and Ingombota. Water trucks have

the second largest utilization rates in Kilamba Kiaxi, Maianga, Samba, Sambizanga and Viana. In Rangel, the second largest water utilization rate comes from water taken from neighbors.

63. Table 12 reveals that electricity is the energy source for lighting with the largest utilization rate in every municipality except Viana, where it comes second, after kerosene. Kerosene has the second largest utilization rate in Cacuaco, Cazenga, Ingombota and Kilamba Kiaxi. Generators are the source with the second highest utilization rates in Maianga and Samba. Candles are the source with the second highest utilization rates in Rangel and Sambizanga.

64. Table 13 shows that gas is the most utilized energy source for cooking in every municipality. Kerosene is the second most used source for cooking in Cacuaco, Ingombota and Kilamba Kiaxi. Coal has the second largest utilization rate in Cazenga, Rangel, Sambizanga and Viana. Electricity has the second largest utilization rate in Maianga and Samba.

65. The pieces of information gathered in Tables 11 – 13 seem to indicate that: (i) access to water provided by EPAL or poor water service delivery is problematic everywhere, but less so in Samba than in the other municipalities; (ii) access to EPAL services or poor water service delivery are particularly very serious problems in Cacuaco, Kilamba Kiaxi and Viana, since only small fractions of residents at these municipalities claim that their primary water source is from home taps; (iii) kerosene is a close substitute to electricity in Cacuaco, Kilamba Kiaxi and Viana, also likely due to difficulties in accessing electricity; (iv) gas is widely used for cooking everywhere; (v) electricity and gas are complements in consumption, since electricity is mostly used for lighting and gas is mostly used for cooking; and (vi) kerosene is a weak substitute to gas, since kerosene's utilization rates for cooking are relatively small when compared to gas utilization rates.

66. From Appendix IIG, we obtain further relevant information about access difficulties faced by the population to consume water, electricity and fuels. Subsections IIG6 and IIG7 provide information about two measures of hardship faced by households to consume water, namely, type of water collector and distance from water source. Time spent collecting water may be very costly to households, especially if water collectors have to divert time away from earning or schooling activities in order to fetch water. The survey reveals that water collection is undertaken by various members of the household, and sometimes by individuals other than household members. Of 1,107 households who answered this question, 456 told us that they make this service the responsibility of male teenagers, 254 said they require every household member to carry out this task, 184 claimed they put their women in charge of it, 79 affirmed they get it from outsiders, 75 mentioned they use female teenagers to execute it, 38 said that they make their children do it and 21 claimed they put their men in charge of it.

67. The cost incurred by a household to fetch water should increase with the distance it must travel from home to do so. The majority of households in our sample have to fetch

water at some place outside of their homes. Of 1,108 households who provided information about this item, 493 said that they get water from places located within 200 meters of their homes, 399 claimed that they do not collect it, 173 affirmed they get it from places located between 200 to 400 meters from home, 40 mentioned that they have to cover more than 500 but less than 1000 meters to get it and 3 stated that they have to travel beyond 1000 meters to obtain water.

68. From subsection IIG8, we gather information about the source of energy and the difficulties faced by households to access energy sources (see Table 14). These pieces of information are distinct from those provided by Tables 11 and 13 in that they inform us about household frequent usage of various energy sources rather than simply the source claimed as the main one. This explains the apparent discrepancies in coal and generator utilization rates revealed by comparisons between the data presented in Tables 12 and 13 and the data presented in the previous paragraph. Respondents rarely claimed that coal and generators were primary sources of energy for either lighting or cooking, but presumably such sources were commonly used in conjunction with other energy sources deemed as primary, such as electricity, gas and kerosene. Interestingly, even kerosene was claimed to be hard to access by a large fraction of users. Gas and coal were deemed as the most and least problematic sources in terms of access, respectively.

Table 14: Source of Energy and Difficulty of Access to Energy Sources

Energy Source	Number of Respondents Per Energy Source		Easiness of Access For Each Source	
	Households Using	Percentage	Households Who Find it Difficult to Use	Percentage Finding it Difficult to Access
Coal	182 out of 1122	16.22	20 out of 170	11.76
Kerosene	265 out of 1120	23.66	111 out of 253	43.87
Gasoline	203 out of 1129	17.98	77 out of 186	41.40
Diesel	62 out of 1120	5.54	15 out of 58	25.86
Gas	1083 out of 1157	93.60	463 out of 1031	44.91
Electricity by Public Company	778 out of 1159	67.13	254 out of 737	34.46
Electricity by Generator	164 out of 1112	14.75	48 out of 148	32.43

69. In conclusion, we find that the vast majority of the population perceives all public services examined here to be highly important but of poor quality. Lack of access or poor quality public service delivery significantly affects choices made by most households, who then attempt to find alternatives to their most preferred choices. This behavioral pattern is also observed in consumption of fuels. The compensation argument seems to have minimal empirical support, if any at all, since poor households, who are most likely to be excluded from both public service delivery and consumption of most preferred water and energy sources, do not appear to derive the greatest benefits from fuel and utility subsidization. These households receive some benefits mainly from gas and kerosene subsidization because the gas and kerosene budget shares for households within the first two quintiles are, on average, larger than their counterparts for households within the other three quintiles. However, the likelihoods that such households find it difficult to have access to gas and kerosene are large.

70. It must also be noted that, given its widespread utilization, gas subsidization yields benefits to the entire population. To see this, consider the following examples of households who greatly benefit from gas subsidization because their gas demands are higher than average: (i) the average gas purchasers in Cacuaco and Kilamba Kiaxi; (ii) households within the fifth quintile; (iii) households who own automobiles; and (iv) households who frequently use coal but deem access to coal difficult. Households with characteristics (i) and (iv) are more likely to be poor than not poor. Households with characteristics (ii) and (iii), however, are well off.

IV. IMPACTS OF FUEL AND UTILITY PRICE CHANGES

71. What are the likely impacts of eliminating/reducing subsidies on households and on the (macro) economy? This section addresses this question.

1. Inflationary Impacts

72. The main goal of this section is to estimate the inflationary impacts of fuel price changes. We examine how changes in the prices of fuels affect the Consumer Price Index (CPI), the Basic Basket Price Index (BBPI) and the Medium Basket Price Index (MBPI) over the relevant time periods, all ending in December 2004.[23] Since the three different baskets of goods and services that give rise to the three different indexes are heavily composed of imported items, it is imperative that we attempt to isolate the effects associated with changes in the relative prices of imported goods and services from those linked with changes in administered prices. Hence, we will proceed in stages, first studying how much of the variances in the indexes are explained by the variance of the nominal exchange rate, and later by the variances of fuel prices. We will then finish this section by examining how both the nominal exchange and the weighted fuel price, when considered together, affect the indexes. In every case investigated, we will also try to capture the effects introduced with the change in policy regime, which took place in September 2003. We will refer to this regime as "Hard Kwanza," since this is the terminology used by some students of the Angolan economy.[24]

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[23] It is important to mention that the methodology utilized to calculate the CPI differs from the ones utilized to calculate the other two indexes and the two different types of indexes are also calculated by different governmental agencies. The CPI is calculated by the National Institute of Statistics (INE) and the Basket Price Indexes are calculated by a branch of the Ministry of Finance. However, both types of indexes inform us about the evolution of prices of commodities and services for the broad Luanda region.

[24] See, for example, Gasha and Pastor (2004) and IMF (2005). The following quote is particularly revealing of the set of macroeconomic policies put in place in 2003: "Since early September 2003, a strong anti-inflationary effort has been implemented by the Angolan authorities. The main features of the stabilization plan include: (i) a "hard kwanza" exchange rate policy; (ii) improved fiscal accounting, but with continued large foreign financing of the deficit; and (iii) enhanced control over commercial banks' liquidity in tandem with closer policy coordination between the Treasury and the central bank. The authorities' program is

73. Let us first examine the monthly changes in the costs of Luanda's basic and medium basket of goods and services during 2004. As it can be clearly observed in Table A66, in 2004 the highest monthly inflation rates for the basket of basic foods and services occurred in May (7.71%) and December (4.5%), mainly as results of price adjustments in fuel (LPG), utilities and transportation services. The cost of the sub-basket of LPG, utilities and transportation services rose by 39.7% and 16% in May and December, respectively, increasing its share in the cost of the full basket, from 13.5% in April to 17.51% in May and from 17.44% in November to 19.37% in December. The cost of the sub-basket of other goods (defined as the full basket minus the sub-basket of LPG, utilities and transportation services) rose by only 2.71% and 2.06% in May and December, respectively. The impacts of fuel and utility price increases on food items were, therefore, very small. The rise in the cost of the full basket was not as high in December as in May partly because the total impact was divided between November and December, smoothing the adjustment in the prices of fuels which took place in November 15 and partly because the prices of LPG, utilities and transportation services all rose in May while just some did in either November or December. Bus fares and electricity charges rose in May only.

74. Another indication that the peaks of inflation for the basket of basic goods and services in 2004 were consequence of price adjustments in fuels, utilities and transportation services comes from the fact that the average inflation rate for the nine months excluding May, November and December was only 0.2%. This suggests that, absent some possible short-lived shocks introduced by the hikes in administered prices, the prices of all other goods were fairly stable in 2004.

75. Similarly to the cost changes for the basic basket of goods and services in 2004, we observe that the highest inflation rates for the medium basket of goods and services (i.e., the basket consumed by medium income households) occurred in May (8.14%) and December (4.54%) – see Table A67. Also, as in the previous case, the impacts of the adjustment in administered prices which took place in November 15 were smoothed out in November and December. The inflation rate in November (4.33%) was almost identical to the one in December.

76. The changes in the prices of fuels and utilities explained most the inflation rates in the peak months. The cost of the sub-basket containing fuels and utilities rose by 55.39%, 19.58% and 18.75% in May, November and December, respectively. The cost of the sub-basket containing the other goods, however, rose by only 3.31%, 2.0% and 1.99%, respectively. The impacts of fuel and utility price increases on food items were, therefore, very small also for medium income households. The increase in the share of the cost of the sub-basket of fuels and utilities relative to the cost of the full basket also reveals the evolution in the importance that fuels and utilities played in explaining the inflation for the full basket of goods and services in 2004: the share of the cost of the sub-

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based on the view that disinflation could be attained by reducing the depreciation of the kwanza against the US dollar and strictly controlling banks' liquidity. The program also assumes that large foreign financing of the fiscal deficit does not affect inflation expectations." (Gasha and Pastor (2004), p. 9).

basket of fuel and utilities rose from 9.34% in January to 17.28% in December. While the cost of the sub-basket of fuels and utilities rose by 120.65% from January to December, the cost of the sub-basket of other goods rose by only 8.8% during the same period. Finally, the average inflation rate for the nine months excluding May, November and December was 0.31%, suggesting that the prices of goods other than fuels and utilities were pretty stationary when administered prices did not change.

Table 15: Descriptive Statistics

	Jan 00–Dec 04		Jan 00–Aug 03		Sep 03–Dec 04	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Angolan Price Indexes						
Consumer (Jan 00 = 100)	1349.21	1056.18	824.32	632.92	2792.64	457.01
Basic Basket (Apr 02 = 100)	219.91	68.25	165.12	49.24	278.13	18.21
Medium Basket (Apr 02 = 100)	200.88	56.52	156.17	40.86	248.39	19.02
Weighted Fuel (Jan 00 = 100)	1601.13	1128.75	1149.27	603.93	2843.61	1755.66
Administered (Jan 00 = 100)	3618.83	2252.92	2715.26	1954.91	6103.65	167.13
Fuel Prices in Angola (in Kz)						
LPG (kg.)	8.88	4.24	7.17	3.01	13.60	3.01
Gasoline (lt.)	10.71	6.55	8.16	3.83	17.75	7.41
Kerosene (lt.)	6.46	3.61	5.03	2.74	10.40	2.69
Diesel (lt.)	7.49	5.65	5.18	2.84	13.81	6.65
Light Fuel (kg.)	5.33	2.91	4.17	2.20	8.52	2.18
Heavy Fuel (kg.)	4.75	2.64	3.89	2.57	7.12	0.54
Asphalt (kg.)	3.72	2.10	2.88	1.60	6.00	1.55
Weighted Fuel Price	7.20	5.07	5.17	2.71	12.78	5.90
Fuel Prices in Angola (in US$)						
LPG (kg.)	0.24	0.12	0.26	0.13	0.16	0.04
Gasoline (lt.)	0.27	0.12	0.28	0.13	0.17	0.07
Kerosene (lt.)	0.15	0.06	0.16	0.06	0.13	0.03
Diesel (lt.)	0.17	0.07	0.17	0.06	0.17	0.07
Light Fuel (kg.)	0.13	0.04	0.14	0.05	0.10	0.02
Heavy Fuel (kg.)	0.11	0.03	0.11	0.03	0.09	0.00
Asphalt (kg.)	0.09	0.03	0.09	0.03	0.07	0.02
Weighted Fuel Price	0.13	0.05	0.14	0.05	0.11	0.04
Fuel World Prices (FOB, in US$)						
Gasoline (Lt)	0.23	0.05	0.21	0.03	0.29	0.05
Crude Oil (Bbl)	27.75	5.93	24.87	3.74	30.69	3.93
Exchange Rates (Kz/US$)						
Real (Jan 00 = 100 for CPIs)	4.02	0.84	4.42	0.56	2.92	0.25
Nominal	46.79	29.33	33.86	23.15	82.33	3.08

77. Table 15 shows descriptive statistics for some Angolan macroeconomic indicators and fuel prices, and for world fuel prices. We divided the observations in three groups in order to see whether the change in policy regime yields some significant and noticeable changes in the patterns of the variables. Comparing the statistics for the CPI with those for the Weighted Fuel Price Index (WFPI) and the Administered Price Index (API) over the entire period, we notice that the CPI was on average smaller and had a smaller variance than the WFPI, which in turn was on average smaller and had a smaller variance than the API. The comparison among means thus indicates that the changes in the prices

of utilities were on average higher than those of fuels, which subsequently were on average higher than those of the remaining goods and services consumed in Angola. The comparison among the variances suggests that the magnitudes of utility price changes were typically higher than those of fuels, and the magnitudes of fuel price changes were usually higher than those of other consumption goods and services.

Table 16: Changes in Indexes Relative to Previous Month (%)

Product	Feb 00	Apr 01	Aug 01	Jan 02	May 04	Nov 04
WFPI	367.73	54.96	62.98	48.61	69.92	34.04
API*	152.60	48.40	30.80	20.20	3.40	1.40
Core CPI**	3.30	11.90	0.50	5.70	4.70	2.00
CPI	10.25	14.11	3.48	7.63	4.49	1.89

Sources: Angolan Authorities and IMF Staff.
* It includes prices of fuels and utilities.
**An estimate constructed by the Angolan authorities to exclude administered prices from the CPI.

78. The descriptive statistics for fuel prices measured in kwanza and dollar terms also reveal some interesting patterns. In kwanza terms, the means of fuel prices were all higher in the Hard Kwanza period than in the pre-reform period. This is hardly surprising since, as we mentioned before, there were six price adjustments from January 2000 to December 2004. Prices of all fuels changed in each episode, though the changes in the prices of gasoline, kerosene and diesel were on average much larger than those of other fuels. Considering the data provided in Table 16 together with the data shown in Table 6, we see that most of the monthly changes in fuel prices were very large relative to the monthly changes in CPI and Core CPI. In particular, the WFPI rose by 69.92% and 34.04% in the two price hikes of 2004 (May and November, respectively) while the Core CPI rose by only 4.7% and 2.0% in the same months. As the prices of imported goods and services did not rise by much in the Hard Kwanza period, prices of fuels increased relative to other prices in this new regime.

79. Returning to Table 15, we observe that the means of all fuel prices, except diesel, were smaller in the Hard Kwanza period when measured in dollar terms, in deep contrast to the pattern we observe when prices are measured in kwanza terms. This is likely due to a combination of three factors: (i) there were sizeable fuel price adjustments in the first period – see Table 6; (ii) the last adjustment in fuel prices in the first period occurred in January 2002, twenty eight months prior to the May 2004 price adjustment, the first in the Hard Kwanza era; and (iii) the Angolan currency depreciated substantially against the dollar during the first period.

80. It is also interesting to note that the average gasoline price in Angola was higher than the average world gasoline FOB price during the period preceding the Hard Kwanza regime. Although there was a reversal in the relationship between the two prices in the second period, it was not sufficiently large to reverse the relationship over the entire period: The average gasoline price in Angola was higher than the average world gasoline FOB price in the period ranging from January 2000 to December 2004.

81. Having discussed some of the noticeable patterns revealed by the descriptive statistics, let us now turn our attention to the estimated statistical relationships between

each of the three price indexes and the nominal exchange rate and fuel prices. When we focus on the nominal exchange rate as the single determinant of CPI, we find that its variance explains 98% of the variance in the CPI, and that a 10% monthly depreciation rate generates a 12% monthly inflation rate – see Table A13.[25] We also conclude that monthly changes in the nominal exchange rate are more important in explaining monthly inflation rates in the new regime than in the previous one. These results are echoed by the others presented in Table A13 in that the nominal exchange rate is shown to be an important determinant of each the BBPI and the MBPI, and monthly changes in the nominal exchange rate were apparently more important in determining both baskets' monthly inflation rates in the Hard Kwanza regime than in the previous one. Although the large hikes in administered prices appear to have caused higher than average monthly inflation rates in May and November 2004, as we mentioned earlier, these results suggest that for the other months during the new regime the variances in the CPI, BBPI and MBPI were almost completely explained by the variance in the nominal exchange rate, and such relationships were stronger than the ones observed in the period preceding the policy shift.

82. When we consider the roles played by fuel prices as determinants of CPI, we find that a 10% increase: (i) in the weighted fuel price yields a 10.6% inflation rate; (ii) in gasoline price leads to a 9.7% inflation rate; (iii) in kerosene price generates a 9.3% inflation rate; (iv) in LPG price causes a 11.6% inflation rate; and (v) in diesel price results in a 8.6% inflation rate – see Table A15. Apparently, an increase in LPG price has the largest impact on the inflation rate. As the analysis in Appendix IIC demonstrates, Table A14, fuel prices are correlated with each other. Hence, their effects were separately estimated.

83. Finally, when we examine the importance of both the nominal exchange rate and the weighted fuel price, acting together, as determinants of the three price indexes, we find that a 10% depreciation rate yields a 10.1% inflation rate measured by the CPI, an 11.4% inflation rate measured by the BBPI and a 10.2% inflation rate measured by the MBPI – see Table A16. Finally, the effects of a 10% increase in the weighted fuel price on the inflation rates measured by CPI, BBPI and MBPI are 1.4%, 0.5% and 0.8%, respectively. All statistical relationships are stronger in the Hard Kwanza regime, indicating that other factors were relatively more important in explaining inflation rates in the previous regime.

2 Microeconomic Impacts

2.1 Data Collection and Data Set

84. Prior to discussing the estimated microeconomic impacts produced from our data analysis, let us briefly describe the data collection process and the resulting data set. Data collection was administered by Datametrica, a Brazilian consulting firm. It hired a

[25] As the quotation in footnote 25 made it clear, the Angolan authorities used the nominal exchange rate as a macroeconomic policy instrument to control inflation from September 2003 on. This fact motivated us to study the effectiveness of this policy instrument prior and after the change in regime.

team of experts at the Catholic University of Angola (CUA) to help it solve logistical problems, recruit and train local interviewers and to prepare the data set. Most of the interviewers were CUA students. The activities started on April 20, 2005 and ended on May 10, 2005.

85. A total of 1,428 households were surveyed. The numbers of households surveyed per municipality were as follows: (i) Cacuaco, 102; (ii) Cazenga, 117; (iii) Ingombota, 289; (iv) Kilamba Kiaxi, 180; (v) Maianga, 266; (vi) Rangel, 94; (vii) Samba, 76; (viii) Sambizanga, 170; (ix) Viana, 134. Hence, Samba and Rangel may have been underrepresented and Ingombota and Maianga may have been overrepresented. Since there is no precise information available about population sizes per municipality, it is hard to evaluate whether or not the above sample distribution is fairly representative of the actual population distribution.

86. Some interviewers reported facing problems in collecting salary information. Some respondents were reluctant in providing accurate information out of fear of revealing too much and later being audited by Angolan fiscal authorities. Another factor that contributed to the difficulty of collecting salary information was the fact that many of the surveyed households were not salaried, since their main economic activities were centered on informal markets. When questioned about these pieces of information, some of such individuals were believed to have created illusionary figures in order to satisfy the interviewers. It is also possible that some salary figures were inflated in order to impress interviewers, as the majority of the highly successful interviewers were females.

87. Apparently, the reported difficulties were very accurate because, upon examination, the collected salary data set turned out to be unreliable. Household incomes computed from salaries were often inconsistent with household expenditures. In addition, salaries did not appear to bear any clear relationship with education levels and age.

88. Rather than using salaries to compute household income, we decided to use total household expenditure as a proxy for total household income. This is common practice in studies of household survey data. There are 1,086 (non-zero) observations of household expenditure in the data set. From these data, we obtained per capita household expenditure by dividing total household expenditure by family size. Per capita household demanded quantities of various products (water, gas, gasoline, diesel, coal, kerosene and electricity) were subsequently derived as follows:

Per capita quantity demanded of good x = (per capita expenditure in good x)/ (price of good x).

89. This process, however, did not generate many observations of kerosene demanded quantity because only a small fraction of households who frequently use kerosene reported how much they paid per unit of kerosene purchased. Hence, we were unable to obtain strong results regarding the relationships between per capita consumption of

kerosene and kerosene's price and household income (expenditure) – that is, kerosene's individual demand function.

2.2 Luanda's Demand Functions for Fuels and Utilities

90. We now examine Luanda's estimated demand functions for fuels and utilities. This analysis will prepare the reader to clearly understand the social and economical implications associated with increasing fuel and utility prices. The analysis will also consider income effects as they will be very important in our discussion of potential palliative measures intended to counterbalance the negative welfare effects brought about by complete removal of fuel and utility subsidies.

91. Standard microeconomic models of consumer behavior teach us that a good's quantity demanded should not be positively related to the good's price (non-positive own price effect), should not be negatively related to the price of a substitute (non-negative cross price effect), and should not be negatively related to the consumer's income (non-negative income effect). Accordingly, in our simple estimations of demand functions for fuels and utilities, which neglect prices of potential substitutes or complements, we expect to find non-positive own price and non-negative income effects.

92. All demand functions meet our expectations regarding own price and income effects. Household total expenditure on goods and services consumed is our measure of household income. Table A17 shows us estimated demand functions for water, gas, gasoline, diesel, coal, kerosene and electricity. The most representative demand functions, regarding the number of observations, are those for gas, water, electricity and gasoline in that order, with 983, 741, 599 and 185 observations, respectively. At the other end of the spectrum, we find the demand functions for kerosene, diesel and coal, with the demand for kerosene being the least representative. The estimated water demand function tells us that a 10% increase in expenditure leads to an expansion of 4.61% in water quantity demanded while a 10% increase in price leads to a 13.88% reduction in water quantity demanded. As for gas, the estimation is that increases of 10% in expenditure and price generate an expansion of 2.81% and a reduction of 2.30%, respectively, in gas quantity demanded. The estimations therefore suggest that the demand for water is more elastic, both in terms of income and price, than the demand for gas.

93. The other estimated fuel demand functions also offer interesting insights about behavioral responses in Luanda. While a 10% increase in expenditure yields a 4.59% rise in gasoline quantity demanded, it leads to a 6.31% increase in diesel quantity demanded. A 10% increase in the price of each product generates reductions of 6.01% in gasoline quantity demanded and of 15.34% in diesel quantity demanded. Hence, the estimations suggest that the demand for diesel is more responsive to changes in both income and price than the demand for gasoline. The estimations for coal and kerosene, unfortunately, do not yield any relevant piece of information.

94. Table A17 also informs us how the estimated electricity quantity demanded varies as expenditure changes. A 10% increase in expenditure leads to a 4.35% expansion in electricity quantity demanded. The survey did not attempt to elicit information about electricity prices. Hence, the estimated electricity demand function does not include the electricity price as an estimator. However, the estimated electricity demand functions described in Table A18 include prices of water and fuels. In carrying out these estimations, the rationale is twofold. First, it is important to find out whether the other products, water and fuels, are viewed as substitutes or complements to electricity. If viewed as substitutes, the signs of the price estimates should be positive. If viewed as complements, the signs should be negative. Second, it is also imperative to know which model provides the best fit for the behavior described by the data. After careful analysis (see Appendix IID), we conclude that in Table A18 model (5) is the one that best fits the data. The estimates suggest that the quantity of electricity demanded expands by: (i) 4.62% when expenditure increases by 10%; (ii) 1.66% when the price of water rises by 10%; and (iii) 2.28% when the price of gas increases by 10%. The estimated positive price effects indicate that water and gas are viewed as substitutes to electricity.

95. In sum, our main findings indicate that the average resident in Luanda responds to changes in income and prices of water and fuels as follows:

(i) an expansion of 10% in income, as measured by total expenditure, yields an increase of
- (a) 4.61% in water consumption;
- (b) 2.81% in gas consumption;
- (c) 4.59% in gasoline consumption;
- (d) 6.31% in diesel consumption;
- (e) 4.62% in electricity consumption

(ii) an increase of 10% in water price leads to a 13.88% decrease in water consumption;

(iii) an increase of 10% in gas price leads to a decrease of 2.30% in gas consumption;

(iv) an increase of 10% in gasoline price leads to a decrease of 6.01% in gasoline consumption;

(v) an increase of 10% in diesel price leads to a decrease of 15.34% in diesel consumption;

(vi) increases of 10% in water and gas prices lead to increases of 1.66% and 2.28% in electricity consumption, respectively.

3. Welfare Impacts

96. This section summarizes the findings of our welfare analysis in Appendix III. We report the estimated welfare (direct) impacts faced by Luanda's average resident with increases in the average prices of water, gas, gasoline and diesel. The results of our incidence analysis, when considered together with the results of our demand analysis of the previous subsection, yield the welfare effects associated with the price changes.

97. The main results of our welfare analysis in Appendix III are as follows:

(i) if the price of water increases by 10%, welfare shrinks by 0.53%;
(ii) if the price of gas increases by 10%, welfare falls by 0.06%;
(iii) if the price of gasoline increases by 10%, welfare drops by 0.10%;
(iv) if the price of diesel increases by 10%, welfare reduces by 0.04%.

98. Although the marginal welfare effects are all small in absolute terms, it is worth noting that the water price effect is significantly larger than every fuel price effect and that the gasoline price effect is larger than the gas price effect. The latter result follows from the facts that gas consumption is universal and gas is viewed as a substitute to electricity. Since the demand for electricity is positively related to gas price, the net negative gas-price-welfare effect is lower than the gross effect.

V. POLICY IMPLICATIONS

99. The main results of Luanda's welfare analysis tell us that the marginal negative social impacts of removing fuel price subsidies will likely be small. For every simultaneous 10% increase in gas, gasoline and diesel prices, social welfare is estimated to decrease by 0.20%. First, let us consider the direct welfare impacts of eliminating gas, gasoline and diesel price subsidies if we arrive at the unit fuel subsidies adopting Sonangol's pricing structure. As we highlighted in subsection 2.2, had the government decided to completely eliminate subsidies in October 2004, the price growth rates would have been: (i) 460.57% for gas; (ii) 388.50% for gasoline; (iii) 360% for kerosene; (iv) 286.43% for diesel; (v) 314.86% for light fuel; (vi) 278.27% for heavy fuel; and (vii) 268% for asphalt. Using our welfare impact estimates, welfare would have fallen by: (i) 2.76% due to the hike in gas price; (ii) 3.89% due to the increase in gasoline price; and (iii) 1.15% due to the growth in diesel price. Considering all these impacts together, welfare would have fallen by 7.80%.

100. Second, if instead of using Sonangol's pricing formulas, we calculate fuel subsidies by comparing fuel retail prices in Angola with fuel retail prices in the USA, and then consider the hypothetical situation that the Angolan government decided to eliminate fuel subsidies utilizing this criterion in November 2004, we conclude that in that month gasoline and diesel prices would have risen by 38.46% and 96.55%, respectively. Hence, welfare would have fallen by: (i) 0.38% due to increase in gasoline price and (ii) 0.39% due to the rise in diesel price. Considering these two impacts together, welfare would have fallen by 0.77%.

101. The results of these two exercises, however, underestimate the total welfare effects of eliminating fuel subsidies because they do not account for the indirect effects (rising costs of transportation and other products) and do not include other direct welfare effects, as for example, those associated with rising kerosene prices. In our analyses of the macroeconomic impacts, we noticed that the effects of raising fuel and utility prices on goods other than fuels, utilities and transportation were small. However, the effects

on transportation costs were significant, since transportation fares increased by almost as much as fuel prices. As medium income groups (second, third and fourth quintiles) are more likely to shoulder the negative effects of increased transportation expenditures, the indirect welfare effects of increasing diesel price are not negligible. We also observed that kerosene budget shares are, on average, higher for first quintile households than for second quintile households and so on, demonstrating negative relationships between income and kerosene budget shares. Hence, the negative effects of increasing kerosene prices will be greater for the poor than for the non-poor population.

102. Although we considered the direct welfare effects of eliminating gas, gasoline and diesel subsidies departing from Sonangol's pricing structure to arrive at fuel subsidies, it should be clear from our comments in subsection 2.2 that such a pricing scheme is very problematic. The unit subsidies are calculated from refinery prices and include tax, cost and profit rates. Refinery prices for all products except diesel are higher than international prices. In addition, subsidies should not include taxes paid to the government, and the cost and profit rates are extremely generous. Undoubtedly, the pricing structure is backed by presidential decree and can be partially rationalized, given the ubiquitous precarious conditions of roads in Angola. However, the high cost and profit rates may be masking inefficiencies in the distribution operation as well as in the operation of the various other activities carried out by Sonangol and its subsidiaries. For instance, there appears to be substantial interregional and intra-regional cross-subsidization in fuel distribution, since operational and marketing cost rates vary significantly across regions and tasks within a given region.

103. However, any attempt to by-pass Sonangol's pricing structure altogether and adopt the international measure of fuel subsidization as the basis from which fuel price increases should be rationalized and built upon must recognize that substantial subsidy expenditures will remain. Such expenditure figures are highly dependent on the unit subsidies derived from Sonangol's pricing structure. Unless the pricing scheme is officially replaced by another one, which embodies a formula that ties fuel price adjustments to international fuel price changes or simply lets the market directly determine the bulk of domestic fuel prices, leaving room for authorities to only determine tax rates, there appears to be little hope that 'actual' fuel subsidies and hence subsidy expenditures will be eliminated.

A Two-Pronged Strategy to Phase Out Subsidies

104. A strategy to phase out subsidies has to be founded on the belief that Angola can use the resources currently allocated to subsidies for more productive uses. Given this, the main policy issues are how to reduce the subsidies while maintaining macroeconomic stability; better allocating spending for development and poverty reduction; compensating the losers and improving social protection for the poor; and selling a coherent and comprehensive package to the public to moderate resistance.

105. Where macroeconomic and fiscal issues are concerned, the authorities will need a medium-term pricing strategy as raising the prices of all utilities to full recovery cost at once and in addition raising fuel prices to the international level may not be feasible or

desirable in the short run. Regarding fuel, a possible strategy for prices would be to use as a target an estimated equilibrium price and design a pricing strategy to meet this target price in the first place and then move on to a second stage to eliminate fuel price subsidies completely. A feasible option in that regard, for example, could be to use as a target the implicit oil price in the 2006 fiscal budget (i.e., US$45/barrel). Assuming that this is a feasible option, domestic fuel prices could be raised to a level compatible with the target price over a 12-month period.

106. In designing the second stage of the pricing strategy, the authorities need to keep in mind the need to maintain macroeconomic stability in the presence of additional savings with the gradual elimination of the subsidies. If there is no program in place about how to spend the extra savings, the additional funds would flow to the GoA budget and the impact would depend on the BNA's policy (whether it is sterilized or not). If programs to spend the money are in place, the impact on the economy will depend on whether the resources flow to consumption or investment and on the productivity of the investment.[26] Therefore, there is a need to think about spending plans in tandem with subsidy reallocation. If savings are to be reallocated to new spending plans, programming needs to be done quickly and jointly.

107. As Sonangol's pricing structure is not likely to change in the short run, thinking about a compromise in terms of addressing this issue and designing the second stage of the phase out may be quite useful. While Angola's road fabric is being rebuilt and investments in expanding the fuel distribution network, with the building of additional gas stations, are being realized, fuel prices can be periodically and gradually adjusted in order to eliminate the gaps between Angolan and USA's fuel retail prices. Adjustments can be made on a monthly basis at rates that do not exceed 10%.[27] As soon as the gaps are closed, periodic adjustments are made simply to keep the perfect parity between Angolan and USA's fuel retail prices.

108. The advantage of acting in this way is that one would prevent Sonangol from being partially subsidized by consumers through taxes levied on fuels, a situation which would emerge if continuous price adjustments eventually led to higher fuel retail prices in Angola than in the USA. By the end of the "government's grant" period, cost and profit margins should be lowered, since the rebuilt road fabric will have already reduced fuel distribution costs. Another potentially advantageous measure at this juncture may be the opening of the fuel distribution network to private oil companies. The lessons learned by Brazil in its recent experience of facilitating entry of firms in fuel distribution and retailing activities should be valuable to Angola if this becomes an attractive policy route.

109. The way forward, therefore, involves two complementary stages. In the first stage, the authorities will need to announce a comprehensive program to deal with subsidies in a phased strategy beginning in 2006. Some limited increase in January to

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[26] A detailed discussion on the impacts of additional budgetary revenues on the macroeconomy can be found the World Bank's Country Economic Memorandum for Angola.

[27] According to Metschies (2005), p. 82, "…the dictates of mass psychology stipulate that **fuel price increases should never exceed 10% of the pump price at any time in real terms**. Instead, long-term price strategies based on numerous regular but modest price increases are to be recommended."

show intent would be a good way to start the program, but the announcement of the program would have to state clearly that the initial objective is to align fuel prices with the 2006 budget's implicit oil price (US$45/barrel). A larger increase could be introduced in mid-2006 matched with a program to spend the funds saved through a compensation program and on needed infrastructure at the same overall fiscal deficit. In the second stage, the current pricing mechanism used by Sonangol should be reassessed and the adjusted level of subsidies phased out gradually while the compensation program designed in the first stage continues to be implemented. At any point in time, the program should be adjusted in case there is a crash in international oil prices.

B. Allocating Savings for Poverty Reduction and Development

110. The phase out of fuel and utility price subsidies represents an extra opportunity to improve spending in poverty reduction and development programs. In contemplating the implementation of a policy of gradually and periodically adjusting fuel and utility prices, Angolan authorities should not neglect the policy's political costs. This is particularly true now in the eave of major elections. International evidence demonstrates that fuel price hikes unaccompanied of a set of palliative measures typically leads to public protests and may trigger violence and social unrest, even at times following elections. The incentives of political contestants of generating public debate and criticism of fuel and utility price increases at times preceding elections are heightened. Incumbents anticipate this and thus know that if they support fuel price increases, they may end up losing high numbers of votes to their competitors.

111. Any program to reallocate fiscal spending should pay close attention to the following broad principles:

- **Political attractiveness:** Off-setting, politically attractive expenditure programs are key to the political and social sustainability of a subsidy removal. A high visibility and credible announcement of compensating measures is an indispensable feature of the package.

- **Pro-poor and effective targeting:** Measures should ideally be those that maximize development and poverty reduction impact. "Compensation" programs should be targeted to benefit the poor and possibly other key losers of the subsidy removal as well. They need to be seen to do so as well.

- **Speed of spending and impact on households:** The speed at which programs are designed and money is spent is important for macroeconomic reasons, while the speed at which programs impact poor households is important for compensatory and political economy reasons.

112. International evidence also shows that the political costs associated with fuel and utility price increases are lower the smaller the relative price changes proposed, the greater the announced benefits that will be promoted with the savings from subsidy cuts and the stronger the government's commitment of carrying out the promised palliative measures. As a matter of fact, in principle, Angolan incumbents may be able to obtain

more public support for the price reform than the losses they are bound to suffer if the palliative measures bring substantially higher benefits to the poor, who make up the large majority of votes in society.

113. One of the palliative measures that may bring large benefits to the poor is water and sanitation policy intended to provide access to higher quality water and sanitation services. Our welfare analysis indicates that changes in water price will bring about a much larger marginal social impact than changes in fuel prices. Given the precarious state of affairs in water infrastructure, management and service delivery, there appears to be ample room for public policy makers to reform the public water sector with the goals of making it more efficient, expanding water supply to the population and improving water quality. Such a reform, if successful, will naturally lead to a substantial reduction in the water price faced by the average consumer in Luanda. The funds needed to finance such a large venture could come from funds saved with the gradual phase out of fuel subsidies and from private sector participation. To erase the welfare loss of 0.20% promoted by simultaneous 10% increases in gas, gasoline and diesel prices, the price paid for water by the average resident would have to fall by 4%. This offsetting price change appears reasonable given the high prices paid by the majority of Luanda's residents in secondary markets.

114. The water and sanitation policy could be divided into two parts, one part geared towards providing poor households with immediate benefits and another aiming at the provision of longer-term benefits. The short-term portion could be designed to expand the numbers of water truck operators and kiosks, promote regulation of water price and quality in the secondary market, and to improve EPAL's managerial efficiency. The experiences of Burkina Faso, Malawi and Zambia with the provision of kiosks should be studied in detail to see if there are some important applicable lessons to be learned.[28] It must be remembered that the proposed short-term policy is likely to bring larger benefits to residents of municipalities where kerosene usage is more common because these are exactly the municipalities more likely to be excluded from piped water service. Thus, this short-term policy could be rightfully termed "kerosene for water policy." The longer-term portion should include sizeable public and private infrastructure investments to repair and further expand both water and sewerage systems, and privatization of management and operation of some segments of the water and sanitation sectors, such as provision of kiosk services.

115. Improvements in managerial efficiency at EDEL are also highly desirable. Since the government's intentions are to phase out fuel subsidies prior to utility subsidies and because electricity is a close substitute to kerosene for lighting purposes and a close substitute to gas for cooking purposes, one should expect the demand for publicly provided electricity services to rise as fuel subsidies are gradually eliminated. The growth in electricity demand may also yield significant revenue collection growth for EDEL provided its billing and collection practices are improved and leakages due to illegal connections are minimized. Investments in infrastructure will also be required in

[28] See "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005, for references of works that describe these countries' experiences with kiosks.

order to guarantee a steady growth in electricity generation capacity, allowing thus EDEL to accommodate the growth in demand. As in the case of water, private participation in management of electricity provision and in infrastructure investment are highly desirable.[29]

116. Consistent with our findings regarding public discontentment with public services, other palliative policies that can be implemented are as follows:

- **Public Education Policy**: Promotion of voucher systems, conditional cash transfers and school meals in order to offer incentives to parents to send their children to school and incentives for children to stay in school;
- **Health Care Provision Policy**: Promote infrastructure investment, offer preventive care and mobile clinics to expand health care service access;
- **Public Transportation Policy**: Creation of a social pass which can be used in buses and vans interchangeably, cost subsidization of van service based on utilization rates, implement employer-sponsored passes.

117. The successful implementation of the program package, including the fuel and utility subsidy phase out programs and any of the proposed palliative programs, requires periodic monitoring and evaluation. Indicators that enable easy assessment of program outcomes should be designed and stakeholder groups should be involved in the monitoring process. If, for example, the proposed short-term "kerosene for water policy" is adopted, monitors should periodically survey the areas intended for expansion of water-truck services and kiosks to check water availability, quality and pricing. Some of the monitors may be members of benefited communities, since they will have great incentives to foster development of water services in their areas of residence. A published monitoring timeframe should be an integral component of the monitoring process and should be made available at the outset. For programs that yield immediate benefits, monitoring should be done early and frequently, say, on a monthly basis. For programs that yield benefits over the longer-term, monitoring should be undertaken later and less frequently, since monitoring is costly and outcomes will not vary much over time in this case.

118. In order to successfully implement the package the GoA will need to form teams and attribute responsibilities. The teams should cover the following main areas: (i) macroeconomic and fiscal issues; (ii) expenditure programming (social protection and compensatory expenditure, and other development and poverty reducing expenditures); and (iii) socialization of savings. They would have to work together and consult each other in order to develop initial proposals based on their own experience and on the findings of this report. The World Bank stands ready to assist the GoA in each of these areas.

[29] See "Private Solutions for Infrastructure in Angola: A Country Framework Report," World Bank, 2005, for a number of feasible alternatives involving private sector participation in electricity provision in Angola.

References

"Angola Energy Sector Needs Assessment: Emergency Response Study," Prepared for USAID, Contract No. LAG-I-200-98-0006-00, Work Order No. 167, Nexant, August 2003.

"Angola Energy Sector Needs Assessment: Mid-Long Term Vision and Needs Assessment Study," Prepared for USAID, Contract No. LAG-I-200-98-0006-00, Work Order No. 167, Nexant, November 2003.

Bacon, R., "Petroleum Taxes," Public Policy for the Private Sector, Note 240, World Bank, September 2001.

Foster, V., "Measuring the Impact of Energy Reform: Practical Options," Public Policy for the Private Sector, Note 210, World Bank, May 2000.

"Four-Day General Strike in Nigeria," World Socialist Web Site, October 22, 2004.

Gasha, J. G. and G. Pastor, "Angola: Pricing Energy and Water Supplies," International Monetary Fund, December 2003.

Gasha, J. G. and G. Pastor, "Angola's Fragile Stabilization," Working Paper 04/83, International Monetary Fund, May 2004.

"Ghana: Muted Protests to Government Hike in Oil Prices," IRINnews.org, Report 45935, March 4, 2005.

Hope, E. and B. Singh, "Energy Price Increases in Developing Countries: Case Studies of Colombia, Ghana, Indonesia, Malaysia, Turkey, and Zimbabwe," Policy Research Working Paper 1442, World Bank, March 1995.

"Indonesia Triples Kerosene Prices to Cap Subsidies," Investments Magazine, October 1, 2005.

"Iran Medium Term Framework for Transition: Converting Oil Wealth to Development," Country Economic Memorandum, Report No. 25848-IRN, World Bank, April 30, 2003.

Pastor, G. and S. Bhattarai, "Angola: Sources and Uses of State Oil Revenue," unpublished manuscript, April 2003.

Pastor, G., M. Alvesson, C. Leite, J. G. Gasha, S. M. Cas, S. Bhattarai, L. Nielsen, A. Torrez, and J. Araujo, "Angola: Selected Issues and Statistical Appendix," Country Report No. 03/292, International Monetary Fund, July 2003.

"Plano Estatégico 2003-2005," Empresa Pública de Águas (EPAL), Angola, 2003.

"Perfil Sócio-Económico da Província de Luanda," KPMG, Angola, January 2003.

"Private Solutions for Infrastructure in Angola," Country Framework Report, World Bank, 2005.

"Reducing Poverty," Indonesia Policy Briefs, World Bank, January 2005.

"Relatório Económico de Angola 2003," Centro de Estudos e Investigação Científica, Universidade Católica de Angola, October 2004.

Roberts, J. and P. Symonds, "Indonesian Budget Sets Stage for Further Political Instability," World Socialist Web Site, October 12, 2000.

IMF "Angola: Selected Issues and Statistical Appendix," Country Report No. 05/125, International Monetary Fund, April 2005.

"Socio-Economic Impact of Fuel Price Increases in Nepal," November 2004.

"Water Supply and Sanitation in Luanda: Informal Sector Study and Beneficiary Assessment," Development Workshop, Angola, June 1995.