1. Introduction

Developing countries seem to be plagued by extreme resource misallocation. Evidence of this comes from both econometric work showing large gaps in total factor productivity between rich and poor countries (Hall and Jones, 1999), and from numerous case studies of rent seeking, the rise of the informal sector and inefficient parastatals. Many of these distortions seem to be created by politicians and the state. Following Bates (1981) most scholars have seen such outcomes as politically rational, even while they are socially disastrous. For example, the most likely explanation of the types of restrictions on entry analyzed by de Soto (1989) and Djankov et al. (2002) is that they generate rents which can be redistributed to generate political support.

However, many aspects of politically induced resource allocation remain puzzling. For instance, there are now many political economy models which can explain underinvestment[1]. Nevertheless, developing countries seem to be plagued not simply by underinvestment, but by investment in the wrong things.

Nothing is as depressing in a developing economy as the presence of *white elephants*. We define a white elephant to be a project with a negative social surplus. Some classic examples come from the activities of INDECO, the Industrial Development Corporation of Zambia. Documenting the failure of this institution to promote development Tangri (1999), p. 30 argues that this was because

> INDECO was subject to a series of ad hoc political directives on specific operational issues, including type and location of investments. Projects were undertaken on political considerations although, as in the case of Mansa batteries, the feasibility study concluded that the project based in Mansa would be uneconomic. Moreover, projects such as the Chinese maize mill at Chingola were started without any feasibility study being undertaken; the decision was a purely political one, which led to the already planned and evaluated maize mill in Kitwe being abandoned. Directives were also issued regarding the location of projects. The locations of the Livingstone Motor Assemblers, Kapiri Glass Products and Mansa Batteries, all subsidiaries of INDECO, were decided on the basis of

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[1] This may be because politicians discount the future too much, because of redistributive taxation (Alesina and Rodrik, 1994; Persson and Tabellini, 1994a), or because of the impact of investment on the future political equilibrium (Besley and Coate, 1998; Acemoglu and Robinson, 2002).

> providing employment outside the main urban areas. These and similar projects ran into difficulties for various reasons, partly because, being located in up-country centres, they were situated a long way from the main markets. Multi-million dollar brick factories were set up under official directive in the rural areas at Kalalushi and Nega Nega, but transporting the bricks long distances to the construction sites raised their costs to uneconomic levels, with the result that the construction industry switched to the use of concrete blocks. Because of the declining demand for its products, the brick works at Nega Nega was forced to close down in 1979 and the factory at Kalalushi incurred large losses.

Tangri's discussion of Zambian industrial policy suggests not only are white elephants built, but they are built when they are understood to be white elephants and, even worse, they crowd out socially desirable projects. Thus it is not just that politicians are bad at picking winners, they actually pick known losers.

One of the most detailed studies of white elephants is Killick's book (1978) about development in Ghana. He discusses in great detail examples of how cost benefit calculations were ignored and inefficient investment projects undertaken. One example was a cattle-based industrial complex (Killick, 1978, p. 231).

> The footwear factory...would have linked the Meat factory in the North through transportation of the hides to the South (for a distance of over 500 miles) to a tannery (now abandoned); the leather was to have been backhauled to the Footwear factory in Kumasi, in the center of the country and about 200 miles north of the tannery. Since the major footwear market is in the Accra metropolitan area, the shoes would then have to be transported an additional 200 miles back to the South.

Killick somewhat understatedly remarks (p. 231) that this was an enterprise "whose viability was undermined by poor siting". As in Zambia, the motivation behind decisions to misallocate resources was clearly political. Rimmer (1969), p. 195, argues that "Projects were begun without feasibility studies and without competitive tendering. New enterprises were distributed among party functionaries as private fiefs, enabling them to give

patronage to relatives, friends, and supporters," and Omaboe (1966), pp. 460 –461, concludes "In Ghana the politicians are always ahead of the civil servants and planners in the general consideration and implementation of economic and social projects".[2]

There are many more well documented instances where the location of public investment projects has been determined by political not economic factors. Bates (1981), pp. 24– 25, 114– 115 discusses many, concluding "governments are often willing to lower the profits of firms in order to secure other objectives—such as plant location that is politically desirable though economically disadvantageous". In their explanation of the catastrophic growth experience of Burundi, Nkurunziza and Ngaruko (2002), p. 1 motivate their political economy approach by arguing that "when priority is given to investment projects as a function of their location rather than the objective need of the economy, the economic model loses its explanatory power". The case study evidence shows that the location of public projects is determined by the desire of politicians to redistribute to their own geographically based groups. In Burundi by the early 1970s the government was controlled by a faction of Tutsi's from Bururi province. Nkurunziza and Ngaruko (2002), pp. 19– 23 document that as a consequence huge amounts of resources were targetted at Bururi including schools, roads, and public sector investments. For instance, even though Tutsi's represented only about 14% of the population, 60% of the managers of public corporations were Bururi Tutsis.

Nkurunziza and Ngaruko also show how state owned companies continued to be funded for long periods even if they made huge losses. In the period 1977 –1982 about 100 state owned companies were created. The main motive was to transfer rents to political supporters. Although (p. 24) "most of the corporations experienced cash flow problems accommodated with

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[2] The Ghanaian case illustrates a key motivation of this paper. The problem under Nkrumah was not underinvestment. Indeed, the consensus view is that the capital stock increased by 80% between 1960 and 1965 (Killick, 1978, p.69), 60% of which being by the public sector (80% of non-residential investment, Killick, 1978, p. 170). The problem was in the way this investment was allocated. Another class of white elephants comes from oil exporters. Following the Arab embargo of October 1973 the sharp increase in oil prices produced large income gains to oil exporters. The bulk of the oil rents were invested in public projects but with no growth payoff (for OPEC as a whole GDP per capita on average decreased by 1.3% each year from 1965 to 1998, see Gylfason, 2001) So that it becomes: (2001). In Nigeria, between 1973 and 1976 capital expenditure rose by a factor of more than nine (see Gavin, 1993) and Gelb (1988), p. 241 finds that "public capital spending accelerated rapidly from only 3.6% of non-mining GDP in 1970 to 29.5% by 1976. This acceleration was so strong that it alone absorbed more than the entire increase in oil income between 1970 and 1976". Gelb (1988) finds that overall about half of the oil rents earned in the six oil exporting countries he studies were invested domestically. He finds a very disappointing growth performance among the countries. For instance (p. 122): "An outstanding case is Venezuela, which simply stopped growing in 1979 despite the largest investment program in its history". Later researchers of the resource curse such as Sachs and Warner (1995), Gylfason (2001) and Auty (2001) have confirmed the weak growth performance of oil exporters. Gavin (1993), p. 216 echoes the consensus explanation when he notes "the tendency for governments to invest in projects with high prestige or political payoff, but with little economic rationale".

massive injections of subsidies" they continued to receive financing and by 1990 "state firms accounted for 31% of formal sector employment, 25% of outstanding domestic credit, and benefited from 3.4% of GDP in financial flows from the government". The public financing continued even longer and "By 1995, equity capital for 36 such firms with majority state participation represented 20% of the country's GDP, but overall, these corporations posted a net loss equivalent to 6% of GDP or 14% of government revenue".[3]

The political nature of the creation and location of white elephants suggests that when political power changes, old investment projects ought to be terminated and new ones begun. In general terms this is the message of Barkan and Chege (1989). They divide the provinces of Kenya into the Kenyatta political base and the Moi political base, each containing 33% of the population. While expenditures on road construction under Kenyatta grossly favored the Kenyatta provinces, when Moi came to power expenditures shifted away from Kenyatta toward Moi provinces. Within 1 year the share going to the Kenyatta base decreased from 44% to 28% of the total, while the share going to the Moi base increased from 32% to 38% of the total. In 1986, 6 years after, the Kenytta base received 16% of the total, while the Moi base received 67%. More specifically, in the context of public investment projects, Keefer (2002), p. 27 reports that "one high official in the ruling government of President Hipolito Mejía of the Dominican Republic claimed that hundreds of projects that were begun by the government of Joaquin Balaguer, two governments before, were then paralyzed under the Leonel Fernández government. Other observers noted that incomplete projects from the Fernández government were similarly halted under Mejía".

The journalistic literature treats white elephants as the worst symptoms of the megalomania of rulers. Yet, a more plausible explanation is that they constitute some form of inefficient redistribution. They are basically an instrument used to raise the income of a particular constituency. Yet why raise incomes in such an inefficient way? The existing literature does not well account for this. For example, the theory of Coate and Morris (1995) rests on the postulate that a white elephant must be believed to be socially efficient with a sufficiently high probability if it is to be built. This does not seem plausible in this context. Similarly, the theory of Lizzeri and Persico (2001) suggests that white elephants might be desirable because they can be targeted at supporters. While this may be true, their theory cannot

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[3] The implications of such resource missallocation emerge when the authors estimate the behavior of TFP in Burundi (p. 8). Though GDP per-capita fell by 40% between 1960 and 1997, the capital labor ratio increased 58 times! In consequence, TFP in 1997 was 4% of its 1960 level.

explain why one would want to target supporters by building a project with negative social value added.

In this paper we build a theory of the construction of white elephants. Most importantly, we show that it is the very inefficiency of such projects that makes them politically appealing. This is so because it allows only some politicians to credibly promise to build them and thus enter into credible redistribution. The fact that not all politicians can credibly undertake such projects gives those who can a strategic advantage. Socially efficient projects do not have this feature since all politicians can commit to build them and they thus have a symmetric effect on political outcomes.

Our theory builds on several key ideas, that white elephants are; (1) part of an exchange relationship between politicians and voters (a situation which political scientists call 'clientelism') where there are important advantages of incumbency[4] , that (2) politicians face commitment problems in offering policy favors in exchange for votes (Alesina, 1988; Besley and Coate, 1997; Dixit, 1997), and (3) this commitment problem may lead to inefficient forms of redistribution being chosen. As is evident from the above examples, the informal literature, though it does not explain why white elephants occur, certainly connects them to clientelistic policies. Also, the political science literature on clientelism is consistent with our emphasis on commitment since the informal, semi-legal character of the relation is recognized (Eisenstadt and Roniger, 1984, pp. 48– 49, for example argue that this is one of the four key elements of clientelism). This implies that patrons ''cannot be sure that the 'clientelistic deal' will be honored, as no legal enforcement mechanism can be devised'' Piattoni (2001), p. 7.

Our model features two groups each of whom is imperfectly represented by a politician. In contrast to most political economy models we do not assume that politicians are either purely opportunistic or purely partisan, to employ the terminology in Persson and Tabellini (2000), where partisan refers to a situation where (p. 10) ''politicians care about the well-being of particular groups in society''. We agree with Persson and Tabellini (p. 11) that ''politicians may be opportunistic but also motivated by a particular ideological view of the world.'' We capture this by assuming that politicians maximize a weighted sum of their own welfare and the welfare of the group they represent, but where their own welfare is most important.[5] We assume that citizens within each group have heterogeneous political preferences

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[4] Weingrod (1977), p. 42 argues that ''Patrons are powerful since they can tap and distribute tangibles—government contracts, jobs loans and the like—and it is through the shrewd investment of these resources that they build and maintain their personal clientele''.

[5] In that sense the objective function of a politician is similar to for example Helpman (1997) where a wheighted sum of campaign contributions and welfare is maximized.

and thus may vote for either politician—a politician representing a group cannot be certain of gaining the votes of members of his group. There are two periods with an election occurring at the end of the first period. One of the politicians is an incumbent who can initially decide on the levels of lump-sum taxes and transfers and how much and what sort of public sector investment to undertake. There are two sorts of projects, one which raises the incomes in the incumbent's region and one which raises the incomes in the other region, and both types of project may be either socially efficient or white elephants. Investment projects undertaken initially can be operated or not after the election. In addition both politicians can make promises of taxes and transfers in order to win the election.

Consider first the incentives of politicians to tax and transfer. Since politicians always value their own consumption higher than that of others, there is never an incentive to make transfers unless this can influence the outcome of the election. However, since we assume that there is no commitment, it is not credible for politicians to offer any transfers at all, or promise a reduced tax burden. The situation with investment projects for the incumbent is different. He can build projects favoring his clients, or the clients of the challenger. These projects can be efficient or inefficient. Consider the political cost benefit calculation of an efficient project, which raises the income in the incumbent's region. This can be initiated before the election and operated afterwards if the incumbent wins and has the benefit of generating positive revenues that the incumbent values. However, these revenues are also valued by the challenging politician who will thus also find it attractive to operate the project should he win the election. The fact that an efficient project will be operated by all politicians implies that it does not increase the incentive of individuals to support the incumbent.

Consider then a white elephant. We demonstrate that such projects can be built by the incumbent because they favor members of his own group and they will be operated by the incumbent but not by the competing politician. They therefore generate large incentives to vote for the incumbent. We show not only that white elephants can be rational to build but that they can even be preferred to efficient projects. An incumbent trades off the electoral benefits from white elephants against the expected revenues that would arise from an efficient project.

Our paper is most closely related to Robinson and Verdier (2002) who argue that public sector employment is a credible way of transferring rents to political supporters, and to Keefer (2002) who study how clientelism may result from repeated face-to-face exchanges between patrons and clients.

Our focus on commitment problems in a principal agent setting is similar to the notion of transaction-cost policies in Dixit (1997), and in particular to the endogenous creation of special interests; Dixit (2003), p. 112. Inefficient spending in our model does not result from a common pool problem as in, e.g. Persson and Tabellini (1994b), since in our model the decision maker faces the full costs of his own spending. Finally, our model is closely related to models where the incumbent chooses policy to bind the hands of his successor, as in the models of public debt by Alesina and Tabellini (1990) and Persson and Svensson (1989). As in these papers we study a dynamic model with partisan politicians but an important difference is that in our model the incumbent chooses policy to tie his own rather than his successors' hands.

Concluding remarks

A central puzzle in the political economy of development is why investment is inefficiently allocated. In many cases this question is far more important than why there is underinvestment. Killick (1978), p. 207 dispairingly concludes in the Ghanaian case that "much of the 'investment' in the first half of the sixties was actually a form of consumption yielding few, if any, returns in the longer run. The larger volume of 'investment'...could not compensate for the low-productivity uses to which it was put". The evidence suggests that this misallocation takes place even when its implications are understood. Thus it is not due to incompetence. Indeed, developing economies such as Zambia and Ghana had teams of economic advisers who undertook intensive cost benefit analyses.

In this paper we have argued that the construction of white elephants should be seen as redistribution aimed at influencing the outcomes of elections. The political motivation behind white elephants is clearly recognized in the political science and development literatures, with Herbst (1989), p. 81 noting that "The main reason why it is so difficult to reform, much less privatize, Africa public sector enterprises is because the central regime does not believe it is in its own political interests to reduce their size and scope... parastatals have traditionally been used as a way to distribute patronage". Yet this literature has not been able to explain why redistribution should take place in such an inefficient form.

Our theory suggests that the reason why redistribution takes the form of socially inefficient projects is that only some politicians can commit to build such projects. All politicians value the revenues that efficient projects tend to generate and thus all politicians can credibly promise to maintain such

projects. However, when politicians represent groups, a particular politician who values the welfare of the beneficiaries of a loss making project may find it optimal to keep operating it when a politician from a different group, who only values the revenues, cannot. In this case such loss making projects can be politically attractive because they affect voting behavior. There is then a trade-off between efficient projects, which generate revenues, and inefficient ones, which influence political outcomes. In this trade-off inefficient projects can be more attractive, particularly when the value of being in power is large.

Killick asks of the Nkrumah government (1978, p. 208), "By what tortured logic did it continue to starve existing industries of materials and spares in order to import the capital equipment needed to create yet more industries?" In this paper we hope to have at least partially elucidated what we feel to be this 'tortured logic'.