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ARE MANAGERS' PERCEPTIONS OF CONSTRAINTS TO GROWTH RELIABLE? EVIDENCE FROM A NATURAL EXPERIMENT IN SOUTH AFRICA

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ABSTRACT

Can surveys of what managers see as the biggest problems that their firm faces provide useful information on the main constraints to private sector and economic development and be used to prioritize reforms in these areas? One of many concerns about doing this is that managers' responses to questions about specific areas of the investment climate might reflect their assessment of overall investment climate or their overall business confidence rather than their views on that specific area of the investment climate. This paper uses a natural experiment in South Africa to assess whether this is the case. When the World Bank's 2007-2008 Enterprise Survey was being carried out, a major electricity crisis hit South Africa. The crisis resulted in many more managers saying that power was a serious constraint on enterprise operations—the share rose from about 10 percent of managers before the crisis to close to 50 percent after the crisis. But it also resulted in greater concern about most other areas of the investment climate—including areas such as taxation, regulation, and other areas of infrastructure that were unrelated to the crisis. This suggests that managers do not fully compartmentalize their responses. Moreover, the changes were large enough to suggest that cross-time and cross-country comparisons of perception data will be difficult.

I. Introduction

In recent years policymakers have used surveys of firm managers to identify constraints to private sector development and growth. For example, through its Investment Climate Assessment program, the World Bank provides policy advice to developing countries based on its Enterprise Surveys. Commenting on the World Bank's Investment Climate Assessments, which use the Enterprise Survey data described in this paper, Dani Rodrik writes "If the term [Investment Climate Assessment] does not mean anything to you, you have not been paying much attention to development policy in recent years." Similar surveys have also been proved popular in benchmarking developing countries' business environments. For example, the Executive Opinion Survey is used to rank countries in the Global Competitiveness Report (Schwab, 2009)—a report that gets considerable attention in the press and among policymakers.[1]

Questions remain, however, on how useful firm surveys are. One criticism is that analyses of these surveys, including the Investment Climate Assessments, often rely at least partly on subjective data to identify constraints. Dani Rodrik writes:

> "These surveys are used increasingly to diagnose the main constraints facing firms and to identify policy reform priorities. If, for example, firms in country A complain most about the cost of finance while in B they complain about a skill shortage, this is taken as an indication country is constrained by poor access to finance while country B is constrained by poor human capital" [2]

One of several criticisms of perception-based data is that it is difficult to interpret the data because managers' responses to questions about constraints might not reflect only their views about individual aspects of the investment climate (e.g., corruption, infrastructure, or macroeconomic instability) but also their overall optimism or pessimism. Managers that are pessimistic about the policy environment might consistently rate all areas of the investment climate as greater constraints than managers that are consistently optimistic. This could be a concern when using perception-based data to make comparisons over time or across countries if average optimism or pessimism vary over time or between countries. It could also be a concern

for within country comparisons if perceptions about different aspects of the investment climate are affected differently by the managers' overall confidence in the policy environment.

This paper uses a natural experiment to assess whether managers compartmentalize their responses to questions about the specific areas of the investment climate. The natural experiment resulted from a serious crisis that hit South Africa's electricity sector in January 2008 as the World Bank's 2007-08 Enterprise Survey was being carried out. The results from this paper show that managers' perceptions about most areas of the investment climate—not just about electricity—were significantly worse after the onset of the power crisis. That is, the crisis seems to have affected not just managers' perceptions about electricity but also their perceptions about other areas of the investment climate—such as access to finance, regulations, taxation, and other areas of infrastructure—that were not significantly different before and after the onset of the crisis.

This suggests at least two problems with using perceptions to identify constraints. Since the power crisis affected perceptions about most other areas of the investment climate, it will be difficult to use perceptions to accurately compare individual aspects of the investment climate over time or across countries. That is, since perceptions about a given area are affected by the problems in that specific area and general business confidence, if business confidence differs across countries or across time, it will be difficult to make accurate comparisons of investment climate constraints using perception-based data. Because the effect is large, this appears to a valid concern.

Another concern is that electricity did not rank among managers' main concerns until after the onset of the crisis. This suggests that perceptions might also not be useful in assessing potential problems. That is, although the crisis was not surprising, electricity did not appear as a major constraint until after the crisis had hit. This suggests that manager's perceptions might not be a good way of identifying potential constraints.

The crisis also appeared to affect perceptions about some areas of the investment climate, such as informality and corruption, more than others. Despite this, however, the relative ranking

of the constraints—except for electricity—does not appear to be significantly affected by the crisis. That is, although concern about most areas of the investment climate was greater after the crisis and there were some difference in degrees, the relative ranking of constraints for areas other than power was not greatly affected by the crisis. As a result, except for power, policymakers using the surveys to assess relative constraints would have identified similar—although not identical—constraints as the major problems before and after the crisis. Although, as discussed in the next section, this does not show that managers accurately assess the main constraints that their firms face—or that the constraints to their firms operations are good predictors of the main constraints to economic development—it at least shows some consistency in responses even in the face of a crisis.

II. Uses of and Problems with Perception Data

Perception-based data can take many forms. Firms could be asked whether the court system is fair, electricity supply is reliable or cheap, or whether they trust their suppliers or customers. The types of questions that this paper is concerned about are perception-based questions on what firms see as the major constraints they face.

Data that takes this form has been used in at least two ways. The first is to identify binding constraints in a single country. If, for example, more firms say that access to finance is a greater problem than inadequately educated workers, does this imply that access to finance is a more binding constraint than worker education? A second is to benchmark constraints either across time or across countries. That is, if enterprise managers in Botswana were more likely to say that access to finance was a serious constraint than managers in South Africa, does this mean that access to finance is a greater problem in Botswana than in South Africa? Or is it possible to say that because enterprise managers were more likely to say that corruption was a serious problem this year than they were ten years ago that the problem has got worse or more binding?

Although it seems possible that the answer to all of these questions is 'yes', many studies have suggested that there are serious problem with perception-based data. For example, Bertrand and Mullainthan (2001) argue that cognitive problems, the social acceptability of some

responses and wrong, non- and soft attitudes all affect the reliability of subjective survey responses. If managers are unable to answer questions on perceptions accurately, if researchers are unable to aggregate responses accurately, or if managers' views on constraints do not accurately represent the true barriers to growth, it will be difficult to use perceptions to assess barriers to growth, to make cross-country and cross-time comparisons and to prioritize reforms.

Broadly speaking, there are three broad questions about perception-based data on binding constraints that might affect whether this is possible. The first is whether firm managers can provide consistent and reliable information about the specific constraints they face. That is, are they able to answer the questions accurately and consistently? The second is whether managers' perceptions can be aggregated in a way that accurately reflects their views. That is, is it possible to aggregate their responses in a meaningful way? The final question is whether perceptions of enterprise managers provide useful information on what are the biggest constraints to development and growth. That is, do managers' views accurately identify constraints to private sector development or economic growth?

The most serious concern is the first – whether managers are able to rate various aspects of the investment climate in a consistent and predictable way. If their perceptions about a specific area of the investment climate reflect something other than the actual constraints that they face, it will clearly make it more difficult to either rank constraints—unless all their answers are affected to the same degree by whatever biases affect their responses—or to make cross-country or cross-time comparisons of constraints—unless firm managers' responses are biased in the same way across time or across countries.

If managers do not really know what the constraints they face are, this will clearly represent a serious problem for perception-based data. One response to this concern is that if enterprise managers don't know about immediate problems that they face with respect to their day-to-day operations, then it is hard to believe that outside experts in government, international organizations, or academia will have a better understanding of these problems. Moreover, it is important to note that the areas of the investment climate that are usually asked about are fairly broad (e.g., tax rates, labor regulation, licensing, and access to finance) not very specific

problems that require detailed knowledge about that area of the investment climate (e.g., about specific tax laws or specific aspects of labor regulation). This should make it easier for managers to answer questions than if they were very specific.

There are, however, other reasons to believe that managers might have some problems with these questions. One concern is that instead of providing information on the specific constraint being asked about, managers might give a general assessment of the entire business environment. That is, they might say that access to finance is a serious problem because they are concerned about the economy or economic policy in general rather than about access to finance specifically.

Some evidence suggests that this is not entirely the case. Using data from the Enterprise Surveys, Hallward-Driemeier and Alterido (2009) note that there is substantial variation in how individual respondents respond to questions on different constraints. They suggest that this shows that there is some degree of differentiation between different constraints. The evidence from South Africa is consistent with this—only three of over 900 firms had no variation in their responses to the obstacle questions. This suggests that managers discriminate to some degree between the different areas of the investment when they answer the questions—or that they give random responses.

But even if managers' are able to understand the constraints they face and they respond to questions about each area of the investment climate thinking at least in part about that area, several things might make rankings and cross-country and cross-time comparisons difficult. Cultural differences or persistent differences in expectations about how the investment climate should look might affect cross-country comparisons. For example, in some countries, it might be more culturally acceptable to complain about the business climate or government policy than in others. If this is the case, then we would probably see more complaints about all aspects of the investment climate in these countries than we do in other countries where complaining about policy is less acceptable.[3]

Similarly, political freedom and freedom of speech might affect whether managers are willing to complain to interviewers about the investment climate more than it affects their willingness to answer objective questions.[4] Since political freedom varies across time within countries and across countries, this could affect cross-country or cross-time comparisons. But it could also affect within country rankings if it is more acceptable to complain about some things than others. For example, it might be easier to complain access to finance or infrastructure than about corruption or political instability in a repressive environment. If this is the case, then within country rankings might not be reliable.

Another concern is that respondents in different countries—or in the same country at different times—might use different yardsticks or reference points to assess the severity of constraints. Having five days each month without power might seem manageable for a firm in a low-income country in Africa that is used to more frequent cutoffs, but might be seen as a serious constraint in a high-income economy such as the United States where firms are used to reliable power supply. If yardsticks or reference points vary across countries or across time, the cross-country or cross-time comparisons will be difficult.

A final related concern is that the overall level of optimism or pessimism might affect responses to questions about individual areas of the investment climate. Although as noted above managers appear to discriminate somewhat in their responses, this does not show their general level of optimism has no effect on their responses. Consistent with this, at the individual firm level, there is a high degree of correlation with respect to how the managers answer the obstacle questions. That is, firms that answer that one obstacle is a major or very severe problem are also more likely to say that other obstacles are major or very severe problems. Of the 120 correlations between responses to obstacle questions for South African firms, all but three are positive. None of the negative correlations are statistically significant. Moreover of the 117 positive correlations, all but six are statistically significant. This strongly suggests that the managers' overall optimism or pessimism affects their responses to individual questions. This suggests that if average optimism varies over time or across countries—and surveys of business confidence suggest that they do—it might be difficult to make cross-time or cross-country comparisons. If their overall level of optimism or pessimism affects their views about some

areas of the investment climate more or less than others, it could also make within country rankings of binding constraints more difficult.

Even if managers can rank or rate constraints correctly, there is an additional problem of aggregating perceptions across firms. Constraints affect different firms to different degrees and perception-based data cannot be aggregated as easily as objective data (for example, costs measured in local currency). This makes it difficult to rank obstacles. For example, it is not clear whether an issue that one firm considers a very serious problem and another firm considers a minor problem, is more or less of a problem on aggregate than one that both consider a moderately serious problem. Or is a problem that one says is the biggest problem and another firm says is the seventh largest problem a greater or lesser constraint than one that both rank as the third greatest constraint?

There is some evidence that this is a concern. For example, the Enterprise Surveys ask two questions related to perceptions—what the manager sees as the biggest problem that they face and whether each area is no obstacle, a minor obstacle, a moderate obstacle, a major obstacle or a very severe obstacle. In South Africa, based upon the percent of firms that said it was the biggest problem that they faced, the five biggest problem were crime (40 percent of firms), electricity (15 percent), access to finance (8 percent), corruption (7 percent), and inadequately educated workers (7 percent). Based upon the percent of firms that said whether each area was a major or very severe obstacle, the top five were crime (38 percent), electricity (21 percent), corruption (16 percent), access to finance (15 percent), and practices of informal competitors (11 percent). The rankings are similar—but not identical.

Problems with aggregating constraints could potentially affect cross-country and cross-time comparisons and rankings within a country. That is, if aggregating the constraints in different ways affects rankings within a country, it is likely that it will also affect cross-country and cross-time comparisons. For the example given above, it seems likely that questions about the biggest problem that they face are more problematic for cross-country comparisons than questions about the relative obstacles that firms face. That is, if some countries have more

difficult investment climates along all dimensions, it is unclear that this would be picked up by the 'biggest' problem question.

If firm managers can accurately answer questions about constraints and these can be aggregated in a meaningful way, then it should be possible to use their responses to measure at least what the managers see as the major problems they face. But this does not mean that this provides useful information on what the main constraints are to private sector development. A third question is whether the perceptions of the enterprise managers interviewed in the survey reflect what the biggest constraints really are in the country. That is, these rankings might represent what the main problems that the firm manager believe they face, but these beliefs might not describe what the true barriers are to broader economic growth.

One reason why this might be the case is that the views of managers of interviewed managers might not reflect the views of non-interviewed firms. In some cases, the omissions are due to conscious survey design—most surveys only cover part of the economy. For example, the Executive Opinion Survey used in the Global Competitiveness report primarily focuses on the large businesses that account the bulk of employment in countries covered in that survey.[5] Similarly, the World Bank's Enterprise Surveys are conducted in the main cities in each country—usually between 3 and 5 locations—and only cover firms in the manufacturing and service sectors with over five full-time employees.[6] So, for example, rural firms and firms in primary production (agriculture and mining) are excluded from the Enterprise Survey. If the concerns of small, medium-sized and large manufacturing and service firms do not reflect the concerns of microenterprises, rural firms, farms or mines, the results will need to be interpreted in this light.

In addition to not reflecting the concerns of firms that are excluded intentionally from the survey (e.g., firms in mining or agriculture or microenterprises), the survey might also not reflect the views of other omitted firms. One group of unintentionally omitted enterprises is potential new entrants. These firms might have different concerns about the investment climate than managers of existing firms. For example, managers of existing enterprises that have already completed registration procedures might not be concerned about entry costs even if they remain

high. It is important, therefore, to think about how constraints might affect new and potential entrants as well as how they affect the managers of existing firms interviewed during the survey.

More broadly, another omitted group is firms that are unable to operate in a country due to problems in the investment climate. For example, in countries where the cost or reliability of power supply is particularly binding, firms that rely upon constant and cheap power might simply be unable to operate. Similarly, if the ports and custom facilities are particularly poor, very few firms might operate in export-oriented industries. Or if transportation costs are especially high or transportation infrastructure particularly poor in some areas, firms that produce perishable, fragile, or heavy goods might not be able to survive. Since you can only interview firms that exist—and by definition these are firms that have managed to overcome the binding constraints—surveys of existing firms may underestimate the barriers due to particularly binding constraints. Hausmann and Velasco (2005) illustrate this point with an analogy to camel and hippos. They note that the few animals that you find in the Sahara will be camels, which have adapted to life in the desert, rather than hippos, which depend heavily upon water. Asking the camels about problems associated with life in the desert might not adequately represent the views of the missing hippos

Problems of omitted firms will potentially affect both cross-country rankings if the industrial structure is different in different countries and within country rankings if the omitted firms have different views on certain areas of the investment climate. Since many analyses of perceptions suggest that different types of firms that are interviewed face different constraints, it seems plausible that these omissions might be important.[7]

A separate problem unrelated to possible differences between the perceptions of interviewed firms and non-interviewed firms is the problem that enterprise managers' interests might not always be consistent with society's interests. Most managers would like subsidized credit or to be charged less for electricity or water if they believed that the cost of providing these services would be borne by someone else. They would also prefer that the burden of taxes falls on others rather than themselves. And most would be happy to face less competition even if the cost to society outweighed the benefits to their firm. It is important, therefore, to think about

how policy changes will affect other stakeholders (e.g., workers and taxpayers) before adopting programs to reduce constraints.

Finally, it is also important to note that although managers may be aware of a problem, they might not be aware of the underlying causes. For example, they might know that it is difficult to get bank loans to finance new investment, but might not know why this is (e.g., lack of competition in the banking sector, government debt issues crowding out private investment, or problems with land registration that prevent firms from using land as collateral). As a result, additional information is needed to assess how to release any given constraint.

These concerns emphasize that it is important to keep in mind the limits of perception-based data. In particular, it is important to keep in mind: (i) that things other than concerns about the specific area being asked about might affect perceptions; (ii) that asking questions and aggregating responses in different ways might affect cross-country and cross-time comparisons and affect within country rankings; (iii) that the perceptions of the interviewed firms do not necessarily reflect the perceptions of firms that are not interviewed either due to conscious omissions or other reasons and (iv) that the views of the managers might not be accurate reflections of the problem facing the economy as a whole.

One broad response to these concerns is to note that at a cross-country level, manager perceptions about specific areas of the investment climate appear to be correlated with objective measures of constraints. Hallward-Driemeier and Alterido (2009), for example, find that many subjective measures of the investment climate from the Enterprise Surveys are significantly correlated with objective measures of the investment climate.[8] At the cross-country level, however, although the correlations are often statistically significant, they are not always high.

Moreover, despite these concerns, perception data does have some advantages over objective data. Also, at a broader level, subjective and perception-based data can sometimes provide information on things that are very difficult or costly to measure objectively. For example, how 'fair' or 'reliable' the court system is. In these cases, perceptions give valuable information on things that would otherwise be very costly or difficult to measure.

It is also important to remember that there are concerns about objective data as well—particularly for sensitive and difficult questions.[9] In comparison to many of the objective questions, the perception questions are both relatively easy for the managers to answer—no implicit or explicit calculations are needed—and many would appear to be less sensitive than their objective counterpart questions. For example, it would seem to be less controversial for a manager to say that corruption is a problem than to answer objective questions such as whether 'firms like theirs' typically pay bribes or whether inspectors requested bribe payments when their enterprise was last inspected.[10]

Another point is that it is important to note that it might be possible to use perception based data to rank constraints within a single country even if the data cannot easily be used to make cross-country comparisons. It is plausible that enterprise managers might be able to provide useful information on the relative constraints that various aspects of the investment climate impose upon then (i.e., telling the interviewer whether tax rates are a greater or lesser problem than access to finance) even if this does not allow the researcher to make valid cross-time or cross-country comparisons.

Although there are many concerns about perceptions, this paper looks at only one specific question—whether responses to questions about perceptions concerning one particular area of the investment climate reflects concern about that specific area or whether perceptions about specific areas are affected by changes in other areas that might affect general business confidence. This is related to the first concern about perception-based data—that managers responses about specific areas of the investment climate might be affected by things other than the actual investment climate in that area. As discussed, this could affect the appropriateness of making cross-country comparisons using perception data and the relative rankings within a single country.

This paper does this by comparing perceptions about all areas of the investment climate before and after a power crisis that hit South Africa in the middle of the implementation of the 2007-2008 investment climate assessment. The goal is to see whether perceptions about other areas of the investment climate were significantly affected by the power crisis. It will also look

at the magnitude of the differences in perceptions to see if they appear to be large enough to affect cross-time and cross-country comparisons. Finally, it will look at whether all areas appear to be affected in similar ways—that is does it have a large impact on the relative rankings of each area. If perceptions about different areas are affected to different degrees, then this will make it difficult to use perception-based data to rank constraints within a country.

III. Data

The data used in this paper comes from the South Africa Enterprise Survey, a World Bank survey of over 800 enterprises that covered Johannesburg, Cape Town, Port Elizabeth and Durban in all manufacturing sectors (group D based upon ISIC 3.1), construction (group F), retail and wholesale services (sub-groups 52 and 51 of group G), hotels and restaurants (group H), transport, storage, and communications (group I), and computer and related activities (sub-group 72 of group K).[11] Firms with five or more employees were included. The sampling frame was constructed based upon a list obtained from the Department of Trade and Industry's Companies and Intellectual Property Registration Office (CIPRO).

The survey took about nine months to complete. Survey implementation began in July 2007 and was completed in March 2008. Between December 18th and January 21st, no interviews were conducted due to the difficulty of obtaining interviews over the Christmas period. This provides an interesting test of how perceptions are affected by a crisis because the survey was ongoing when a major power crisis hit South Africa.

In mid-January 2008, South Africa was hit by a series of serious power outages and brownouts.[12] The immediate causes of the crisis was some power plants being closed for routine maintenance, others breaking down, and coal stocks dwindling after unseasonably wet weather closed some open pits when they were flooded (Lewis, 2008). But the crisis also reflected underinvestment in the power sector in the late 1990s and early 2000s despite growing demand. At the time of the crisis, thus it was widely reported that the longer term problems due to underinvestment would mean that the power was likely to remain a constraint for at least five years until new power plants could start operating (McCreal, 2008).

This was a particular shock because South African firms had been used to relatively cheap and reliable power. The 2005 Investment Climate Assessment, which was based upon a 2003 survey of South African firms, noted that firms in South Africa spent less on power and suffered fewer outages than firms in many other middle income economies such as Brazil, China and Malaysia (Clarke and others, 2007; 2008). Based upon the percent of firms that said each area of the investment climate was a serious problem, power was ranked by enterprise managers as the 13th largest constraint out of 18 constraints asked about in that survey. Similarly, although the need for additional investment in infrastructure was noted, power was not specifically noted as one of the six binding constraint on growth in the Government's *Accelerated and Shared Growth Initiative for South Africa* (2006).[13] Finally, although acknowledging that South Africa would bump up against infrastructure constraints in the near future, none of the 21 recommendations of *the International Panel on Growth*, a panel of international and South African academics convened by the South African Treasury were specifically and primarily focused on power infrastructure (Hausmann, 2006).[14]

This said, however, the crisis was not entirely unexpected. Observers had noted that underinvestment in power infrastructure would likely cause problems for the country. For example, before the crisis in September 2007, the Economist Intelligence Unit noted "despite a small capacity margin, the creaking system is coping to date. However, there remains a risk of power outages" (Economist Intelligence Unit, 2007). Moreover, as noted above, both the *Accelerated and Shared Growth Initiative for South Africa* (Presidency of the Republic of South Africa, 2006) and the *International Panel of Growth* summary report (Hausmann, 2006) noted that underinvestment in infrastructure in the power sector meant that accelerated investment was needed.

The outages contributed to a significant decline in business confidence in South Africa in the first quarter of 2008. The Bureau of Economic Research (BER), which does a general business confidence survey, show a steep decline in business confidence in the first quarter. In the last quarter of more than two-thirds of respondents said that they were satisfied with prevailing business conditions in December 2007 compared with less than half in March 2008. The Bureau of Economic Research noted that the electricity blackouts were one of the primary

reasons for the large decline in business confidence observed between the surveys in December 2007 and March 2008 (Bureau of Economic Research and Rand Merchant Bank, 2008).

The crisis resulted in a large increase in the number of firms saying that electricity was a serious problem for their operations. In the last half of 2007, only 9 percent of firms said that power was a serious constraint and only 6 percent said it was the biggest constraint that they faced. For firms interviewed after mid-January 2008, 48 percent said it was a serious constraint and 34 percent said it was the biggest constraint that they faced.

The crisis, however, did not only appear to affect perceptions about electricity. Although perceptions about electricity decreased the most, more firms said that every area of the investment climate was a serious problem between January and March 2009 than said the same between July and December 2008 (see Table 1). That is, taking the information at face value, it appears that nearly every area of the investment climate became a more serious constraint between late 2007 and early 2008.

Although the firms interviewed in the second group of interviews were similar to the firms in the first group, there were some minor differences (see Table 2). There were some geographic differences—no firms were interviewed in Port Elizabeth in late 2008, some differences with respect to sector—more manufacturing firms were interviewed in 2008 and firms interviewed in early 2008 were larger, older and more likely to export. An econometric analysis can confirm that the changes in perception are not due to changes in sample composition before and after the crisis.

IV. Econometric Results

Methodology.

The question of whether perceptions changed after the crisis is explored by estimating different versions of the equation below:

$$\text{Perceptions}_i = \alpha + \beta_1 TD_i + \gamma \text{ Firm Characteristics}_i + \epsilon$$

The dependent variables are dummy variables indicating whether the manager of firm i rates that area of the investment climate as a major or very severe obstacle. The main variable of interest, TD_L, is a dummy variable indicating that the interview was conducted after mid-January. Since no interviews were conducted between December 18th and January 21st, due to the survey team taking a break over this period because it was difficult to schedule interviews over the Christmas period, the dummy basically indicates whether the interview was conducted before mid-December or after mid-January

To control for the possibility that differences in the samples (see Table 2) might affect results, the regressions include some control variables. These include a dummy variable indicating firm ownership (whether the firm is foreign owned), a dummy variable indicating whether the firm exports, a continuous variable indicating firm size (log of number of workers) and a continuous variable indicating the age of the firm. In addition, a series of dummies indicating sector of operations and regional location are included (see footnote to Table 3). The error term is assumed to be normally distributed. Because the dependent variable is a dummy variable, the model is estimated using standard maximum likelihood estimation (i.e., an ordered Probit model). Results from the regression for each of the obstacles are shown in Table 3 and Table 4.

Empirical Results

The main variable of interest is the dummy variable indicating the timing of the interview. The coefficient on this variable is positive and statistically significant in the equation with perceptions about electricity (see Table 3). Since higher values on the index mean that the firm manager perceived electricity as a more serious obstacle, the positive coefficient indicates that managers interviewed between January and March 2008 were more likely to say that power was a serious problem than managers interviewed between July and December 2007. This is consistent with the idea that managers interviewed after the start of the power crisis were more likely to say that they saw power as a serious obstacle than those interviewed before the start of the crisis.

The difference is very large. Based upon the predicted probabilities from the ordered Probit model (see Table 5), which control for differences in the two samples, close to half of managers would have said that power was a major or very severe problem in interviews after the start of the crisis compared with only about one in ten managers before the start of the crisis. This strongly suggests that managers were surprised by the onset of the crisis or at least by the impact that the crisis had on their firms' operations.

A more interesting question is whether the crisis had a significant impact on perceptions about other areas of the investment climate. This will give some idea about how effectively managers compartmentalize their perceptions about different areas of the investment climate. If the crisis appears to have had an impact on perceptions about all or most areas of the investment climate, this would suggest that their responses are at least in part affected by their overall confidence in the economy.

Firm managers do not appear to fully compartmentalize their perceptions. Of the 15 other areas of the investment climate that were asked about, managers interviewed after the beginning of the crises were significantly more likely to say that 11 were more serious problems than managers of similar firms interviewed before the crisis (see Table 3 and Table 4).

The changes were relatively large. Estimates of the average increase in the likelihood that the manager would say that the area was a significant problem for the areas of the investment climate other than electricity were between 2 and 9 percent for the areas where the differences were statistically significant (see Table 5). Given that there were only three areas of the investment climate—crime, corruption, and access to finance--that more than 10 percent of firms said were serious problems before the crisis (see Table 1), these changes are large.

It is possible that some of these declines might reflect other changes in the investment climate. For example, concern about political instability might have been affected by the December 2007 ANC conference, where Jacob Zuma replaced Thabo Mbeki as ANC leader (Bureau of Economic Research and Rand Merchant Bank, 2008). Similarly, although the survey was completed before the financial crisis became severe, perceptions about access to finance

might have been affected by the turmoil in international capital markets due to problems with sub-prime mortgages in the United States.[15] However, perceptions about most other areas of the investment climate including other areas of infrastructure (transport and telecom), regulation (labor, trade, and business licensing), also declined over this period strongly suggesting that overall business confidence affects managers perceptions about areas of the investment climate.

Effect on relative rankings

Not surprisingly after the crisis, based upon the predicted probabilities, more firms ranked electricity (49 percent) as a problem than any other problem (see Table 5). In contrast, it is estimated that only 11 percent of firms would have said the same before the crisis. Based upon the percent of firms saying that each problem was a major problem, this moved electricity from the third greatest constraint before the crisis to the greatest constraint after the crisis.

The points estimates of the effects are also different across areas. The changes in predicted probabilities for areas other than electricity vary between -1 percent and 9 percent. Some of the differences are statistically significant while others are not.

For the most part, however, the changes in predicted probabilities did not have a significant impact on relative rankings based upon the percent of firms that said each area was a significant problem for areas other than electricity (see Table 6). Other than electricity, the three greatest constraints based upon the predicted probability were crime, corruption, and access to finance before the power crisis. These remained as the three greatest constraints after the crisis. Similarly, few firms rated business licensing, tax administration, trade regulation, or courts as a serious constraint before or after the crisis.

The biggest changes in relative rankings were for political instability, which went from fifteenth to tenth after the start of the crisis, and labor regulation, which went from sixth to eleventh. As noted above, the change in political instability might be related to the December 2007 ANC conference, where Jacob Zuma replaced Thabo Mbeki as ANC leader.

It is less clear why perceptions about labor regulation changed over this period. Both before and after the crisis, about five to six percent of firm managers said that labor regulation was a problem both before and after the crisis. This, however, results in a large relative drop—from sixth place before the crisis to eleventh place outwards. There were not, however, any significant changes in labor legislation between late 2007 and early 2008.[16] The Doing Business measure of labor regulation, which is based upon written rules, was unchanged between 2006 and 2009. It is interesting to note that the concern about the other constraint that is related to labor—inadequately educated labor—also fell relative to other constraints (from fourth to sixth).

In summary, although perceptions about most areas changed after the crisis hit, for the most part this did not rank relative rankings other than for electricity. In particular, concern about crime was very high both before and after the crisis and although firms were more likely to say that corruption and access to finance were serious problems after the crisis, these remained as the second and third greatest constraints after the crisis. In short, with the exception of electricity, a policymaker assessing the greatest constraints to firm operations using measures based upon the percent of firms that said each area was a serious problem would reach similar conclusions about the main problems before and after the crisis. Although, as discussed above, this does not show that firm manager's perceptions provide useful information on the main constraints, at least it shows that in this respect their perceptions about relative constraints were not drastically altered by the power crisis.

Effect on cross-time and cross-country comparisons

In addition to questions about how the crisis affected relative ranking of constraints within South Africa, it is also interesting to look at whether these changes are large enough to affect cross-time and cross-country comparisons. Given the percent of firms that were saying certain areas of the obstacle were serious problems, between 0 and 15 percent before the crisis for most areas other than crime and the size of the relative changes, which were between about 2 percent and 7 percent in most cases, it seems plausible that this could occur. An earlier Enterprise Survey, which only covered manufacturing, was conducted in South Africa in 2003. For the areas of the investment climate where the questions were asked in the same way, it is

possible to compare the percent of manufacturing firms that said that various areas of the investment climate were serious problems between the 2003 survey and the 2007-08 survey.[17]

This comparison provides some limited support for the idea that some of the changes are large enough to affect comparisons (see Table 7). Other than for electricity, the most notable difference is for corruption. Based upon the percent of firms that said that it was a serious obstacle, it would appear that corruption was reduced or stayed about the same between 2003 and late 2007 (from 16 percent to 14 percent). In contrast, if the comparisons were made between 2003 and 2009, it might appear that concern about corruption increased. Comparisons for access to land and business permits might also lead to different conclusions about trends in perceptions as well.

It is also possible to compare results from the 2007-08 South Africa Survey with Enterprise Surveys from other countries. In this case, we compare the before and after crisis figures from South Africa with Enterprise Surveys from Botswana, Namibia, and Swaziland from 2006 (see Table 8).[18] These countries are chosen because they are middle income economics that neighbor South Africa.

There were several changes in rankings due to the power crisis other than for power. For example, fewer firms said that informality was a serious constraint in South Africa (8 percent) before the crisis than in Namibia (11 percent) in 2006, but more firms said it was a serious constraint in South Africa after the crisis (19 percent). Similarly before the crisis fewer firms in South Africa said access to land was a serious constraint (8 percent) than in Namibia (10 percent) or Swaziland (12 percent). But after the crisis, more firms in South Africa said it was a serious problem. Similar points could be made about several of the other measures (e.g., access to finance, corruption, political instability, business licensing, and telecommunications). This emphasizes that the changes due to the crisis appear to be significant enough to also change the relative rankings of countries based upon the percent of firms that say each area was a problem.

V. Conclusions

During the field work from the 2007-08 South Africa Enterprise Survey, a major power crisis hit South Africa. The crisis greatly amplified concern about the power sector. Before the crisis only about one in ten South African firms said that power was a serious constraint for their firms' operations. After the crisis, almost half did. Given the massive increase in concern about the power sector—even though it was widely noted before the crisis that significant investment would be needed in the sector and that outages could become a problem—this suggests that firm surveys might not be useful in identifying future constraints to growth.

More disturbingly, however, perceptions about other areas of the investment climate unrelated to power also appear to be affected by the crisis. After the crisis, firm managers interviewed after the crisis were significantly more likely to say that eleven of fifteen areas were serious constraints than managers of similar firms interviewed before the crisis. Although some of these changes might be because of other changes in the external environment (for example, access to finance and political instability), this strongly suggests that perceptions about specific areas do not only reflect concern about that specific area of the investment climate but also business confidence.

The changes are large as well as statistically significant. In most cases, the crisis appears to have increased the likelihood that managers would say the other areas of the investment climate were serious problems by between 2 and 7 percentage points. Since before the crisis, most areas were ranked as serious problems by between 0 and 15 percent of firms, this is a significant change. Moreover, as shown above, these changes were large enough to complicate cross-time and cross-country comparisons.

Another concern is that the crisis appears to have affected perceptions about different obstacles to different degrees. Although these results suggest that caution should be used when using perception data, it is important to note that the crisis appears to have had only a modest impact on relative rankings. Except for electricity, which went from the fourth to the top constraint based on the percent of firms that said each was serious problem, the other top

constraints remained the same before and after the crisis (crime, access to finance, and corruption). Although this does not mean that these are the most binding constraints in South Africa—as noted above there are other concerns such as about explicit and implicit restrictions on the sample—it at least shows some consistency in responses before and after the crisis.

VI. References

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VII. Tables

Table 1: Percent of firms saying each area of the investment climate is a constrain in late 2007 and early 2008

	Jul-Dec 2007		Jan-Mar 2008		Change in percent saying major problem
	Percent saying serious problem	Rank (excluding Electricity	Percent saying serious problem	Rank (excluding Electricity	
Electricity	**8.7%**	**---**	**48.1%**	**---**	**39.4%**
Average (excluding electricity)	**7.3%**		**11.7%**		**4.4%**
Crime	38.5%	1	37.0%	1	-1.5%
Access to Finance	11.5%	3	24.5%	2	13.0%
Corruption	14.6%	2	21.9%	3	7.3%
Informality	7.9%	4	19.0%	4	11.1%
Access to land	7.6%	5	14.2%	5	6.6%
Worker Education	7.1%	6	12.3%	6	5.3%
Tax Rates	3.6%	8	6.8%	7	3.2%
Political Instability	1.3%	13	6.7%	8	5.3%
Labor Regulation	5.6%	7	6.5%	9	0.8%
Transportation	3.0%	10	6.0%	10	3.0%
Business Licensing	2.0%	11	5.3%	11	3.3%
Telecommunications	3.1%	9	5.1%	12	1.9%
Trade Regulation	1.0%	15	4.1%	13	3.1%
Tax Administration	1.5%	12	3.1%	14	1.6%
Courts	1.2%	14	2.6%	15	1.5%

Source: World Bank Enterprise Surveys.

Table 2: Properties of firms interviewed in late 2007 and January and early 2008

	Jul-Dec 07	Jan-Mar 08
Number of Workers	58	69
Age of Firm	15	16
Exporter	15%	25%
Foreign owned	7%	10%
Manufacturing	64%	85%
Retail Trade	21%	8%
Other Services	16%	6%
Cape Town	8%	16%
Johannesburg	66%	66%
Port Elizabeth	11%	0%
Durban	14%	18%

Source: World Bank Enterprise Surveys.

Table 3: Ordered Probit regressions for different obstacles on enterprise characteristics and a dummy variable indicating interview was in early 2008.

	1	2	3	4	5	6	7	8	9
Dependent Variable	**Electricity**	**Average excluding Electricity**	**Telecom**	**Transport**	**Access to Land**	**Tax Rate**	**Tax Administration**	**Trade Regulation**	**Courts**
Observations	919	919	919	919	919	919	919	919	919
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Timing of Interview									
Interview between Jan-Mar 2008	**1.302*** **	**0.237*** **	**0.509*** **	**0.685*** **	**0.493*** **	**0.599*** **	**0.404*** **	**0.346*** **	-0.034
(dummy)	**(14.31)**	**(6.96)**	**(4.96)**	**(7.06)**	**(4.83)**	**(5.91)**	**(3.59)**	**(3.05)**	(-0.28)
Firm Characteristics									
Number of workers	**0.085** **	0.016	0.044	0.044	-0.059	0.015	**0.118** **	**0.106** **	0.104**
(natural log)	**(2.40)**	(1.18)	(1.06)	(1.09)	(-1.34)	(0.34)	**(2.49)**	**(2.26)**	(2.03)
Age of firm	-0.034	**-0.032***	0.084	**-0.095***	**-0.116** **	-0.060	**-0.119***	-0.073	-0.052
(natural log)	(-0.76)	**(-1.84)**	(1.52)	**(-1.79)**	**(-2.10)**	(-1.09)	(-1.92)	(-1.19)	(-0.79)
Firm is exporter	0.026	-0.039	-0.120	0.047	0.011	0.037	0.007	**0.439*** **	-0.123
(dummy)	(0.26)	(-0.98)	(-0.99)	(0.40)	(0.09)	(0.30)	(0.06)	**(3.52)**	(-0.85)
Firm is foreign-owned	0.228*	-0.023	**0.449*** **	0.070	0.035	-0.087	0.013	0.156	-0.060
(dummy)	(1.78)	(-0.45)	**(3.11)**	(0.47)	(0.22)	(-0.53)	(0.08)	(0.98)	(-0.32)
R-squared/Pseudo R-Squared	0.130	0.121	0.0517	0.0699	0.0563	0.0526	0.0504	0.0692	0.0466

Source: Author's Calculations based upon data from the World Bank's Enterprise Survey for South Africa (2007-08)

Note: All regressions are ordered Probit regressions except for column 2 (OLS). Dependent variables are index variables with: 0 indicating no obstacle, 1 indicating minor obstacle; 2 indicating moderate obstacle; 3 indicating major obstacle; and 4 indicating very severe obstacle. The average is an average of all index variables except for electricity. The interview was either in late 2007 (July-December) or early 2008. Sector dummies are included for: garment manufacturers; textile manufacturers; food and beverage manufacturers; chemical and pharmaceutical manufacturers; construction material manufacturers; furniture and wood manufacturers; metal and metal product manufacturers; paper, printing and publishing manufacturers; plastic manufacturers; electric equipment manufacturers; motor vehicle manufacturers; other manufacturing; retail and wholesale trade; hotels and restaurants; construction; transportation; and other services. Regions are Johannesburg, Cape Town, Durban and Port Elizabeth.

***, **, * Statistically Significant at 1%, 5% and 10% significance Levels

Table 4: Ordered Probit regressions for different obstacles on enterprise characteristics and a dummy variable indicating interview was in early 2008.

	1	2	3	4	5	6	7	8
Dependent Variable	**Labor Regulation**	**Inadequately Educated Workers**	**Business Licensing**	**Access to Finance**	**Political Instability**	**Corruption**	**Crime**	**Informality**
Observations	919	919	919	919	919	918	919	918
Sector Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Timing of Interview	919	919	919	919	919	918	919	918
Interview between Jan-Mar 2008	-0.086	0.126	**0.525*** **	**0.443*** **	**0.691*** **	**0.283*** **	-0.039	**0.417*** **
(dummy)	(-0.90)	(1.39)	**(4.67)**	**(4.58)**	**(6.40)**	**(3.18)**	(-0.47)	**(4.53)**
Firm Characteristics								
Number of workers	**0.136*** **	**0.223*** **	-0.063	**-0.112*** **	0.053	0.025	0.013	**-0.082** **
(natural log)	**(3.60)**	**(6.01)**	(-1.30)	**(-2.73)**	(1.17)	(0.68)	(0.39)	**(-2.10)**
Age of firm	0.057	-0.010	**-0.162*** **	**-0.184*** **	0.032	-0.008	-0.029	0.008
(natural log)	(1.14)	(-0.20)	**(-2.76)**	**(-3.64)**	(0.54)	(-0.18)	(-0.68)	(0.16)
Firm is exporter	**0.299*** **	0.043	-0.093	**-0.431*** **	-0.099	-0.129	**-0.242** **	**-0.242** **
(dummy)	**(2.87)**	(0.42)	(-0.68)	**(-3.64)**	(-0.77)	(-1.25)	**(-2.54)**	**(-2.19)**
Firm is foreign-owned	-0.153	**-0.227***	-0.082	0.016	**0.269***	-0.171	**-0.287** **	0.005
(dummy)	(-1.09)	**(-1.65)**	(-0.47)	(0.11)	**(1.69)**	(-1.28)	**(-2.36)**	(0.03)
R-squared/Pseudo R-Squared	0.0481	0.0577	0.0855	0.0900	0.0779	0.0245	0.0320	0.0604

Source: Author's Calculations based upon data from the World Bank's Enterprise Survey for South Africa (2007-08)
Note: See Table 3 for additional notes.
***, **, * Statistically Significant at 1%, 5% and 10% significance Levels

Table 5: Estimated predicted probabilities for firms if all firms had been interviewed in the two periods

	Late 2007	Early 2008	Difference
Electricity	11%	49%	38%
Access to Finance	10%	18%	9%
Access to Land	5%	13%	7%
Informality	8%	15%	7%
Corruption	15%	22%	7%
Transport	2%	8%	6%
Tax Rates	2%	8%	6%
Political Instability	1%	6%	5%
Telecom	3%	7%	5%
Business Licensing	2%	5%	3%
Tax Administration	1%	4%	2%
Inadequately Educated Workers	8%	10%	2%
Trade Regulation	2%	3%	2%
Courts	2%	2%	0%
Labor Regulation	6%	5%	-1%
Crime	37%	36%	-1%

Note: Predicted probabilities are estimated for each observation in data set as if the interview was conducted in the relevant period. The average of these predicted probabilities is then shown in the table. Rounding may mean that the difference is slightly different from the difference in the two numbers.

Table 6: Changes in relative rankings (excluding electricity) based upon predicted probabilities

	Late 2007	Early 2008	Difference
Electricity	---	---	---
Crime	1	1	0
Corruption	2	2	0
Access to Finance	3	3	0
Informality	5	4	1
Access to land	7	5	2
Inadequately Educated Workers	4	6	-2
Tax Rates	9	7	2
Transport	10	8	2
Telecom	8	9	-1
Political Instability	15	10	5
Labor Regulation	6	11	-5
Business Licensing	13	12	1
Tax Administration	14	13	1
Trade Regulation	12	14	-2
Courts	11	15	-4

Note: Predicted probabilities are shown in Table 6.

Table 7: Perceptions about constraints in 2003 and late 2007/early 2008 for manufacturing firms only

	2003	Late 2007	Early 2008
Telecommunications	3%	4%	4%
Electricity	9%	9%	50%
Transportation	10%	3%	5%
Access to land	4%	7%	14%
Tax Rates	19%	5%	6%
Tax Administration	11%	2%	2%
Trade Regulation	17%	1%	3%
Labor Regulation	33%	6%	6%
Business Licensing	3%	2%	5%
Corruption	16%	14%	21%
Crime	29%	33%	36%

Source: World Bank Enterprise Surveys.
Note: The 2003 survey only covered manufacturing so the comparisons are only for manufacturing (i.e., only manufacturing firms are included for 2007-08 survey as well). All figures are actual comparisons (not predicted).

Table 8: Perceptions about constraints before and after crisis and in Botswana, Swaziland and Namibia

	July 2007-Dec 2007	Jan 2008-Mar 2008	Botswana	Namibia	Swaziland
Electricity	9%	48%	7%	6%	12%
Access to Finance	12%	25%	41%	18%	33%
Informality	8%	19%	23%	11%	41%
Corruption	15%	22%	23%	19%	25%
Access to land	8%	14%	24%	10%	12%
Political Instability	1%	7%	2%	1%	7%
Worker Education	7%	12%	20%	20%	13%
Business Licensing	2%	5%	18%	3%	23%
Tax Rates	4%	7%	25%	20%	28%
Trade Regulation	1%	4%	11%	7%	16%
Transportation	3%	6%	13%	8%	14%
Telecommunications	3%	5%	7%	4%	11%
Tax Administration	1%	3%	10%	4%	19%
Courts	1%	3%	4%	6%	8%
Labor Regulation	6%	6%	9%	7%	10%
Crime	38%	37%	24%	28%	34%

Source: World Bank Enterprise Surveys.
Note: Includes all firms – not just manufacturing. All figures are actual comparisons (not predicted).

VIII. Endnotes

[1] The Global Competitiveness report receives substantial coverage in the pres when it comes out. See, for example, Braithewaite (2009). Other rankings also rely at least in part on data from firms surveys and perception-based data. For example, the World Governance Indicators measure of Control of Corruption (Kaufmann and others, 2008) and Transparency International's Corruptions Perceptions Index (2008), which compare corruption across countries, also partly rely on expert and firm managers' perceptions about corruption.

[2] See Dani Rodrik's weblog (2007)

[3] Hallward-Driemeier and Alterido (2009) refer to this as a 'kvetch' factor.

[4] This appears to be true for both sensitive and less sensitive questions. Jensen and others (2008) show that non-response patterns and lying reduce measured corruption in politically repressive environments. But similar patterns also appear for less sensitive questions. In particular, Clarke and others (2006) show that firms appear to complain more about access to finance in countries that are more free politically than in other countries after controlling for other country and firm characteristics.

[5] The Global Competitiveness report has historically focused on larger, foreign-owned enterprises, although this focus has shifted in recent years. For example, the 2004-05 report noted that 'survey respondents should be chief executives or members of senior management with some international perspectives' (Porter and others, 2005, p. 200). In the 2009 report, it is noted that the 'survey sampling guidelines' emphasize the need to have a sample with a sufficient presence of large companies (Schwab, 2009). When the sample for the Executive Opinion Survey is compared with the Enterprise Survey sample, the comparison suggests that this remains the case. For example, in Zambia, about 37 of the 90 enterprises in the Executive Opinion Survey (40 percent) that reported their size had over 100 employees For the weighted sample for the Enterprise Survey, only about 13 percent had over 100 employees. Even the Enterprise Survey, with its restriction on firms having at least 5 employees, ignores most small firms. The Zambia Business Survey, a survey focusing on microenterprises, noted that two-thirds of MSMEs in Zambia have no employees other than the owner and 97 percent have less than 10 employees (World Bank, 2009a).

[6] Based upon the ISIC 3.1 categorization, the Enterprise Survey covers all manufacturing sectors (group D), construction (group F), retail and wholesale services (sub-groups 52 and 51 of group G), hotels and restaurants (group H), transport, storage, and communications (group I), and computer and related activities (sub-group 72 of group K). Survey design is discussed on the World Bank's Enterprise Survey website in more detail (www.enterprisesurveys.org). See also, World Bank (2009b)

[7] Most Investment Climate Assessments include some analysis of how perceptions differ for different types of firms. See, for example, the ICAs for Africa on the World Bank's website (http://go.worldbank.org/VTQZO1FF40). Other studies have also looked at the questions. For example, Gelb and others (2006) and Hallward-Driemeier and Alterido (2009) both analyze this how perceptions differ between firms for a wide number of constraints (e.g., by size, foreign or domestic ownership, export status, location, age). Other studies have looked at how perceptions differ for individual constraints. See, for example, Beck and others (2005) and Clarke and others (2006)for work on access to finance.

[8] Gelb and others (2006) find some significant correlations (e.g., for finance, power, and corruption) in surveys for Africa, but weaker correlations for measures related to regulation. Hellman and others (1999) show that perceptions about exchange rates and telecommunications infrastructure are correlated with objective data in these areas using data from Eastern Europe and Central Asia

[9] For example, some work has shown that managers appear to find it difficult to answer questions that involve calculating percentages. Clarke (2008) shows that managers in Sub-Saharan Africa that report bribes as a percentage of sales report bribe payments that are between four and fifteen times higher when they report them as a percent of sales than when they report them in monetary terms. This does not appear to be due to outliers, differences between firms that report bribes in monetary terms and firms that report them as a percent of sales, and the sensitivity of the corruption question. Lying is also a problem. Azfar and Murrell (2009) show that even broad questions about corruption, including questions about 'firm like yours', suffer from serious problems with lying and non-response that can lead to substantial underestimates of the extent of corruption.

[10] In the Enterprise Survey, many objective questions on sensitive questions are asked indirectly to reduce these concerns. For example, on the issue of corruption, firms are asked the question "we've heard that establishments are sometimes required to make gifts or informal payments to public officials to get things done with regard to customs, taxes, licenses, regulations, services etc. On average, what percentage of total annual sales, or estimated annual value, do establishments like this one pay in informal payments/gifts to public officials for this purpose?" There are also a series of direct questions about bribe requests for licenses and utility connections and during inspections. For example, in the question on utility connections, firm managers that reported applying for utility connections were asked whether 'a gift or informal payment was expected or requested' not whether

a bribe was paid. Thus, they can admit that a bribe was requested without actually admitting whether it was paid. Azfar and Murrell (2009) argue that even broad questions about corruption, including questions about 'firm like yours', suffer from serious problems with lying and non-response.

[11] World Bank (2008) describes the sampling methodology in greater detail.

[12] See Center for Development and Enterprise Roundtable (2008) for a detailed description of the crisis.

[13] The six areas were: volatility and level of the currency; cost, efficiency and capacity of the national logistics system; shortage of suitably skilled labor amplified by the impact of apartheid spatial patterns on the cost of labor; barriers to entry, limits to competition and limited new investment opportunities; regulatory environment and the burden on small and medium businesses; and deficiencies in state organization, capacity and leadership (Presidency of the Republic of South Africa, 2006). Moreover, the government recognized that infrastructure investment was needed in many areas in addition to power. These included provincial and local roads, bulk water infrastructure and water supply networks, housing, schools and clinics, business centers, sports facilities, and multi-purpose government service centers, including police stations, courts and correctional facilities

[14] Recommendation 12 notes that "The [Industrial Development Corporation] should also look at specific infrastructure projects that can address industry-specific needs, such as industrial zones" and recommendation 13 notes "The strategy [of the Department of Trade and Industry] should focus on the provision of industry-specific publicly provided inputs, such as infrastructure, property rights, regulation, research and development, market studies and market access conditions to be identified by a myriad of self-organizing bodies. Finally, recommendation 15 notes that the Government should "Require municipalities rated by National Treasury as "poor" in capacity to use central bodies (e.g. National Roads Agency, Department of Water and Forests, IDT) for procurement or provision of municipal services such as water, electricity, roads, housing, and sanitation" None of these are specifically aimed at the power sector however. See Hausmann (2006).

[15] It is however important to note that the survey was mostly complete before the largest disruptions associated with global financial crisis occurred. The last interview in March was on March 17th, 2008. As a result, only 2 interviews were completed after Bear Stearns was sold to JP Morgan Chase on March 12th. This was far earlier than the most turbulent times in international capital markets in the summer and fall of 2008 (i.e., when Lehman Brothers went bankrupt and the U.S. Government provided significant funds to Fannie Mae, Freddie Mac, AIG and other financial institutions).

[16] The Skills Development Act was amended at the end of 2008. This, however, was after the survey was completed.

[17] The 2003 survey only covered manufacturing so the comparisons in Table 7 are only for manufacturing. The comparisons are only for the areas that are asked about similarly in both surveys. For example, the 2003 survey asked about access to finance (collateral) and included a separate question on cost of finance (interest rates), while the 2007 survey asked about access to finance (availability and cost). The 2003 survey asked about 'skills and education of available workers' while the 2007 survey asked about 'inadequately educated workers'. The 2003 survey asked about 'economic and regulatory policy uncertainty' while the 2007 survey asked about 'political instability'. The 2003 survey asked about 'legal system/conflict resolution', while the 2007 survey asked about courts. Finally, the 2003 survey asked about 'anti-competitive or informal practices' while the 2007 asked about 'practices of competitors in the informal sector'. Since these all seemed sufficiently different that they might be interpreted differently in the two surveys., comparisons are omitted for these questions. Two other questions that are included in the table had slightly different wording: 'transportation of goods, supplies and inputs' in 2007 and 'transportation' in 2003; and 'business licensing and permits' in 2003 and 'business licensing and operating permits' in 2003. These, however, seemed closer and so are included in the table.

[18] The surveys were very similar to the 2007-08 South Africa survey. All covered the same sectors (i.e., not just manufacturing) and have similar questions. The only differences were that the 2007-08 survey asked about 'courts' and ''transportation of goods, supplies and inputs', while the 2006 surveys asked about 'functioning of the courts' and 'transportation'.