

# Essays on Fiscal Transparency and Inflation Expectations

by

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# Abstract

This dissertation comprises two related essays on fiscal transparency and a third essay on inflation expectations.

The first chapter provides a brief introduction to the next three chapters.

The second chapter proposes some indices of fiscal transparency based on the IMF's *Code of Good Practices on Fiscal Transparency*. Each country is assigned a category for a number of aspects of fiscal transparency based on the information in the IMF's "Fiscal Transparency Reports on Observance of Standards and Codes (ROSC)". This classification is used to construct indices covering four clusters of fiscal transparency: data assurances, medium-term budgeting, budget execution reporting, and fiscal risk disclosures. I consider the robustness of these indices to different choices associated with construction of the indices. Lastly, I present some cross-country comparisons of fiscal transparency and analyze the relationship of other institutional variables to fiscal transparency.

The third chapter examines several hypotheses regarding fiscal transparency using the indices developed in the second chapter. I discuss the channels through which fis-

cal transparency can affect market credibility, fiscal discipline, and corruption. After controlling for other socio-economic variables, more transparent countries are shown to have better credit ratings, better fiscal discipline, and less corruption.

The final chapter considers the question whether inflation expectations are driven by household inflation experience. Household surveys reveal that inflation expectations vary considerably across households. Furthermore, studies have found that these expectations vary systematically over demographic variables. This chapter suggests that the variation in individual expectations of inflation may be based partly on the inflation experienced by individual households. I calculate a household specific level of inflation based on the BLS consumer expenditure survey (CEX) data. Then a two-sample two-stage estimation methodology is used to study the correlation between the experienced household inflation and reported inflation expectations data in the Michigan Survey data for similar households. I find that expectations of inflation indeed vary with the inflation experience, moreover personal experience seems to be overly influential.

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# Chapter 1

## Introduction

Many academics and policy makers have started to pay more attention to the policy-making institutions instead of just focusing on policies. Transparency of institutions is increasingly emphasized as an integral part of reforms. Although the importance of transparency is recognized, the empirical work on transparency has been limited by the dearth of quantitative measures of institutions. This dissertation contributes to this literature by developing several summary indices of fiscal transparency. I use these indices to empirically examine how fiscal transparency is related to credit ratings, fiscal discipline, and corruption.

In the wake of the Asian and Mexican crises, there was a renewed emphasis on acquiring information on country institutions and the transparency of these institutions. This led to development of internationally recognized standards of good practices covering various areas of the economy. One of the standards approved by

the IMF board was the *Code of Good Practices on Fiscal Transparency*. The IMF publishes reports which assess the observance of these good practices by member countries, titled “Fiscal Transparency Reports on the Observance of Standards and Codes (ROSC)”. These reports are mainly textual which makes quantitative analysis difficult.

The second chapter briefly defines fiscal transparency and then details how the textual information is converted to numerical data. Each country is assigned a numerical category based on the information in the Fiscal Transparency ROSCs for twenty different aspects of transparency. Although the classification involves judgment, the results should be similar if others follow the same methodology. The aspects of transparency are organized into four clusters: data assurance, medium-term budgeting, budget execution reporting, and fiscal risks disclosure.

The first cluster considers practices of transparency that focus on assurances of quality and timeliness of fiscal data. These improve the reliability and credibility of government data and make it easier for those outside the government to understand and analyze the budget. This includes such practices as requiring independent assessment of forecasts and commitment to advance release calendars for fiscal data.

Although government budgets are based on an annual cycle, they usually have to take into account factors outside the budget cycle such as long-term investment plans or multi-year expenditure programs. The next cluster of transparency considers practices that address the medium-term nature of the budget process. The five issues

considered under medium-term budgeting are: statement of fiscal objectives, forward estimates, identifying new policy costs, use of a medium-term quantitative economic framework, and statements of fiscal/macro risks.

Disciplined budget management is a crucial requirement for transparency and problems at the budget execution stage can make any budget ineffective. This cluster includes information on the accounting system, internal audits, and external audits. The last cluster on disclosure of fiscal risks considers several sources of fiscal risk that can influence a government's fiscal position. Requiring the government to publish information on possible sources of risk would reduce the uncertainty regarding its fiscal position.

A summary index of fiscal transparency is calculated as a mean of the numerical categories for all the available aspects of transparency for each country. Similarly, the sub-indices are calculated as means of their respective components. The aggregation methodology is subject to several sources of uncertainty including: weighting of different aspects, choice of aspects, number of categories assigned, aggregation/composite methodology, and assessment of categories. Robustness of the methodology used is assessed by considering randomly generated weights and using different aggregation methodologies.

With the increasing interest in fiscal transparency, some organizations such as the International Budget Project (IBP) and Oxford Analytica have started to develop fiscal transparency indices, albeit for a smaller number of countries. Comparing the

summary index developed in this paper with other indices can provide a check for the methodology. Moreover, it can demonstrate the robustness of transparency results across different measures of fiscal transparency. The analysis indicates that these indices are indeed correlated with the proposed indices.

Some cross-country comparisons of the fiscal transparency indices are also presented. These comparisons can serve two purposes: first, to provide a further check on the construction methodology by comparing earlier findings on fiscal transparency (based primarily on qualitative analysis) across groups of countries, and second, the comparison can suggest some new findings that can be explored further. One result that clearly comes out of this analysis is that higher income countries in the sample have higher fiscal transparency.

A natural question to ask is how do more transparent countries measure in terms of other institutions? If a country is more transparent it is likely that certain political and economic conditions exist which may be conducive to improvements in other institutions. The particular institutions I consider are democracy, trade openness, financial depth, government effectiveness, and voice and accountability.

The third chapter takes this analysis further by addressing three specific hypotheses on fiscal transparency. It will examine whether countries with more transparent fiscal practices have more credibility in the financial markets, better fiscal discipline, and less corruption.

The strategy in the empirical section is to first identify a parsimonious model

for each of the variables of interest (credit ratings, fiscal balance, and control of corruption) based on existing literature. Transparency indices are then added to the model to test if transparency is related to the variable of interest after accounting for the selected control variables. The empirical section is limited to cross-section analysis because the fiscal transparency indices have no time variation. Another important theoretical consideration is the issue of endogeneity of fiscal transparency. Institutions drive economic conditions, but at the same time economic conditions can influence institutions. Endogeneity makes it difficult to claim causality between fiscal transparency and performance variables, but it is still useful to show correspondence between them.

This paper argues that more fiscally transparent countries have higher credibility in the markets reflected in higher credit ratings after controlling for other economic fundamentals. If markets can be more certain about a fiscally transparent government's ability and willingness to service its obligations, they are likely to demand lower premiums when compared to similar less transparent countries. Various transparency-related measures have been shown to affect credit ratings, sovereign spreads, foreign direct investment (FDI), and asset allocation. Although these studies consider measures of transparency broader than fiscal transparency, they show that transparency matters to the markets.

Additionally, I argue that after controlling for certain institutional and economic differences, a more transparent government is likely to be more fiscally disciplined.

For example, if the government is forced to produce quality budget execution data and take stock of its fiscal risks, there is a lower probability of a large surprise deficit. The paper shows that more transparent countries have higher primary balances even after including several control variables.

Fiscal transparency can affect corruption through many channels. For example, opportunities for some forms of corruption maybe reduced due to increased accountability and more effective auditing. Based on a commonly used variable for corruption, I show that more transparent countries have better control over corruption.

The last chapter is unrelated to the first two chapters. It asks whether inflation expectations are driven by household inflation experience? The question of how inflation expectations are formed is important, particularly in monetary economics where the economic effect of monetary policy is crucially dependent on how expectations are adjusted. Since the introduction of rational expectations, significant attention has been paid to modeling inflation expectations; but still, the empirical work on micro-level expectations data has been limited. The last chapter is an empirical examination of how household inflation expectations may be formed.

Household surveys reveal that inflation expectation vary considerably across households. Moreover, many studies have found that these expectations vary systematically over demographic variables. This chapter suggests that the variation in individual expectations of inflation may be based partly on the inflation experienced by individual households.

I calculate a household specific level of inflation based on the BLS consumer expenditure survey (CEX) data and item level price series. I adjust the data for durable goods because the CEX records net expenditure and the data I need is the amount of durable goods consumed in a particular year.

The next section compares the data in the Michigan Survey and the household-specific experienced inflation dataset. The demographic variables considered are age, income, gender, marital status, race, education, vehicle ownership, and whether the household includes children. A comparison of the available demographic variables shows that the two datasets are quite similar. An analysis of the mean inflation experience and inflation expectations suggests that they vary systematically across various demographic groups across the two datasets.

Finally, a two-sample two-stage estimation methodology is used to study the correlation between the experienced household inflation and reported inflation expectations data in the Michigan Survey data for similar households. I find that expectations of inflation indeed vary with the inflation experience, moreover, personal experience seems to be overly influential.

# Chapter 2

## Indices of Fiscal Transparency

### 2.1 Introduction

Over the last two decades, transparency has taken on increasing importance as a significant explanatory variable for economic outcomes. Although the research on transparency has spanned every sector of the economy, much of the literature is theoretical/conceptual in nature with insufficient attention paid to the empirical analysis of transparency.<sup>1</sup> This is not surprising, since transparency is an institutional characteristic and, by their nature institutions are difficult to quantify. Even when data are available, it is difficult to find consistent cross-sectional data for a large group of countries.

The main contribution of this paper is the development of new summary indices

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<sup>1</sup>With the exception of Central Banking transparency, which has received considerable empirical attention.

of fiscal transparency based on publicly available IMF Reports on Observance of Standards and Codes (ROSCs) for the IMF's *Code of Good Practices on Fiscal Transparency*.<sup>2</sup> This code was created by the IMF as part of an effort to address the renewed emphasis on acquiring information on country institutions and the transparency of these institutions in the wake of the Asian and Mexican crises.<sup>3</sup> The ROSCs are mainly textual which makes quantitative analysis difficult. This paper converts the textual information to numerical data by classifying the different practices in transparency over numerical categories. The particular sub-indices of transparency considered include data assurance, medium-term budgeting, budget execution reporting, and fiscal risks disclosure. Most of the previous research on transparency has focused on a small group of countries such as the EU countries, OECD countries, Latin America countries, and Central and Eastern European countries.<sup>4</sup> This paper attempts to remedy this situation by constructing a broad index for 57 countries over a range of geographic locations, development stages, and institutions.<sup>5</sup>

The paper will start with a definition of fiscal transparency and a discussion of why fiscal transparency matters. The next few sections will describe the source data and present a detailed explanation of the classification methodology. This will also

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<sup>2</sup>Several indices of fiscal transparency have been proposed including those by Oxford Analytica, International Budget Project (IBP), and Alt and Lassen (2003), but these are available for a limited number of countries and constructed differently. These are discussed in a later section.

<sup>3</sup>The code and fiscal transparency reports are discussed in more detail in a later section.

<sup>4</sup>See Von Hagen and Harden (1995), Alt and Lassen (2003), Stein and others (1999), and Ylaoutinen (2004).

<sup>5</sup>More Fiscal Transparency ROSCs have been completed since the inception of this project and will be included in future revisions.

provide the motivation for the different aspects of transparency that are included in the indices. A discussion on the calculation methodology and its robustness to various choices including weights for different aspects, aggregation/composite techniques, selection of aspects, and choice of categories for classification will follow.<sup>6</sup> The last section will compare the indices to earlier indices of transparency, present some cross-country comparisons of the index, and discuss the relationship of fiscal transparency to other institutional variables.

## 2.2 Why Fiscal Transparency?

There is a growing body of literature on fiscal/political institutions and their effect on economic outcomes.<sup>7</sup> Economic outcomes are a result of a combination of government policy choices and underlying economic fundamentals. However, the policies themselves are driven by the existing policy making institutions, which makes studying these institutions ever more important.

Several theoretical frameworks have been suggested to studying the effects of institutions on fiscal policy and economic outcomes. In most studies, it is recognized that transparency is important but it is usually subsumed under a larger budget institutions category. We argue that transparency can actually reduce many of the institutional causes of distortions that have been suggested in the models described

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<sup>6</sup>There is a vast amount literature on development of indices and benchmarking in general which is beyond the scope of this paper. For a recent review, see European Commission (2002).

<sup>7</sup>See Von Hagen and Harden (1995) and Alesina and others (1999) for collection of studies on affect of budget processes and political institutions on fiscal outcomes

below. The transparency itself may not lead to better policies but its interaction with other participants like the civil society and government debt markets should lead to better outcomes.

### **2.2.1 Incentives for being Less Transparent**

In order to illustrate what fiscal transparency means, it may be useful to consider the reasons governments may want to be non-transparent and the practices used to be non-transparent. At the most basic level transparency requires that the government publish budget and fiscal data on a regular basis, but this is only a sufficient condition for transparency. Today's budgets are complex, mostly due to the complex budget processes that give rise to them. This makes it possible for a government to strategically influence the beliefs of other agents in the economy. Therefore, despite publishing significant fiscal information, it is still possible for a government to be non-transparent. There are many reasons why the governments would want to be non-transparent, which are discussed below.

First, the authorities may want to be non-transparent to take advantage of a policy surprise. In central banking literature, it has been argued that ambiguity of policy can yield benefits because the government will have a strategic advantage in information.<sup>8</sup> Similarly, ambiguity in budget policy may allow the government to exploit the information advantage.

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<sup>8</sup>See Cukeirman and Meltzer (1986) and Alesina and Cukeirman (1991).

Another reason, as suggested by Rogoff (1990), is that lack of transparency might allow the incumbent to create information asymmetries regarding the incumbent's "competence" in public goods production. The political budget cycles in this extended signaling model are a result of the incumbent's signaling of competence through higher expenditure. The idea is that lower transparency makes it difficult to determine if the current economic conditions are a result of incompetent policies or good/bad economic shocks. More fiscal transparency may make it easier to distinguish between these, reducing the signaling incentive.

Governments may want to be less transparent and engage in "creative accounting" if they are at the risk of breaking certain policy rules, such as the EU deficit limits. Milles-Ferreti (2000) shows that in rules where the limits are placed on measured policy outcomes and there is punishment for "creative accounting", then higher budget transparency results in a lower difference between the actual and measured policy outcomes. Higher transparency increases the probability of getting caught thus reducing the incentive to cheat.

Another reason to be less fiscally transparent is corruption. Limited internal and external audit along with low quality budget execution data would make it easier for the public officials to be corrupt.

Now let us consider some practices used to be less fiscally transparent and actions which can to curtail these practices. In no way is this list exhaustive, but it does highlight some important practices which make it difficult to determine the fiscal

position and intent of the government.

- Overly optimistic macroeconomic projections: Governments can project higher revenues than justified by economic fundamentals in order to present lower projected deficits. When the outcomes are different, as expected, the shortfall can be attributed to unfavorable macroeconomic outcomes. One way of preventing this practice is to require scrutiny of macro projections by independent experts. In addition, using and publishing a medium-term macroeconomic framework may force the government to explain changes in its annual projections.
- Off-budget activity: In particular, a government can keep some large liabilities off-budget to present a more positive fiscal picture.
- Strategic use of multi-year budgets: For example, hard reforms are pushed to the future years, thus looking responsible and buying time.

The code of fiscal transparency was specifically designed to address some of these concerns, but the focus of this paper is on how certain practices enhance transparency instead of addressing how the different codes prevent certain non-transparent practices. See Section 2.3.2 for more details on how different practices of transparency considered enhance transparency.

### 2.2.2 Empirical Studies of Fiscal Transparency

Several empirical studies in the literature have considered measures of fiscal transparency, but usually only as components of an overall budget institutions index. An example is Von Hagen (1992), where in a survey of European Community (EC) members the survey respondents were asked directly if the budget was transparent, with the answers coded from (0) hardly transparent to (4) fully transparent. Von Hagen (1992) constructs sub-indices titled: the informativeness of the budget draft; flexibility of budget execution; long-term planning constraint; and structure of the negotiations within government; and structure of parliamentary process. These were then used to address several hypotheses including whether or not a long-term orientation of the fiscal policy enhances fiscal discipline. A sub-index developed in the current paper titled “medium-term budgeting frameworks” can be used to address a similar question.<sup>9</sup>

Using a similar approach, Alesina and others (1996) extend the research to Latin America. Employing data from a survey of budget institutions in Latin America, they conclude that budget institutions do indeed have a significant impact on primary deficits. Stein and others (1999) use the same data for budget institutions but also include electoral institutions. In both of these studies, although transparency is not the focus, it is included as one of the three broad categories.

Another transparency related empirical study is by Hallerberg and Von Hagen

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<sup>9</sup>See Hameed (2005).

(1999), which considers the fiscal institutions in EU-15 in context of electoral conditions. A recent study, Ylaoutinen (2004) analyzes the budget institutions in Central and Eastern European Countries (CEEC). The study finds that more “centralized” fiscal procedures result in better fiscal discipline. Many of the characteristics of a “centralized” budget are similar to different aspects of transparency in the current paper, including multi-year planning, macroeconomic assumptions, and ex-post control and accountability.

Finally, Alt and Lassen (2003) focuses directly on fiscal transparency and fiscal policy outcomes. The paper focuses on OECD countries and uses a career-concern model of politics with political parties to derive a testable hypothesis, namely that equilibrium debt decreases with an increase in transparency. The paper constructs a measure of fiscal transparency from a self-reported 1999 OECD Questionnaire. The study concludes that debt is indeed negatively related to fiscal transparency in OECD countries. The paper also proposes some political drivers of fiscal transparency such as political competition, common law history, and presidential systems.

## **2.3 What is Fiscal Transparency? and its Assessment**

Fiscal transparency refers to practices that provide a clear picture of the government’s past fiscal performance, current fiscal stance, and future fiscal policy.

Kopits and Craig (1998) define fiscal transparency as:

“Openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities - whether undertaken inside or outside the government sector - so that the electorate and financial markets can accurately assess the government’s financial position and the true costs and benefits of government activities, including their present and future economic and social implication.”

As this definition suggests, fiscal transparency is a much broader concept than just provision of information. Starting from this definition the IMF developed a *Code of Good Practices on Fiscal Transparency*<sup>10</sup> which was approved by the IMF board in 1998. The code is divided into four sections with thirty-seven elements. The four main sections of the code are: clarity of roles and responsibility; public availability of information; open budget preparation, execution, and reporting; and assurances of integrity. The code identifies good practices from current practices in various countries and earlier conceptual work on transparency. The code is explained in more detail in the *Manual on Fiscal Transparency*.<sup>11</sup>

### **2.3.1 Reports on Observance of Standards and Codes**

The IMF publishes reports which assess the observance of these good practices by member countries, titled Fiscal Transparency Reports on Observance of Standards and Codes (ROSC). Participation in preparation of the ROSC is voluntary and the

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<sup>10</sup>Available via the internet: <http://www.imf.org/external/np/fad/trans/code.htm#code>

<sup>11</sup>Available via the internet: <http://www.imf.org/external/np/fad/trans/manual/toc.htm>

members retain the right to decide on publication. Since the inception of the Fiscal Transparency ROSC program, over 65 ROSCs have been completed with over 60 published.<sup>12</sup> This study excludes the unpublished ROSCs and the initial ROSCs because they were experimental and in some cases self-assessments. Many of the earlier ROSCs have been updated several times and are published as separate documents. The information used to construct the indices includes all the updates and published ROSCs.<sup>13</sup> The quality of ROSCs has generally improved over time with increased detail, comprehensiveness, and better organization.

Elements of the *Code of Good Practices in Fiscal Transparency* have several sub-components and cover a wide range of topics. The reports for each country note the extent of observation for elements of the code. The ROSCs are textual in nature, and the organization of the report does not strictly follow the code. So, the first step was to divide the report according to elements of the code.<sup>14</sup> Then, the textual information was used to assign numerical categories to selected practices.

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<sup>12</sup>All the published reports are available on the IMF Standards and Codes website at <http://www.imf.org/external/np/rosc/rosc.asp?sort=topic\#FiscalTransparency>. Since the inception of this study, several additional ROSCs have been published and will be included in future analysis.

<sup>13</sup>Although this study does not have a time-series dimension to it, the future research agenda includes introducing a time series component by considering the updates separately. Further, it is envisaged that on average the countries will be reassessed every 4 years, allowing a richer analysis of changes in practices of fiscal transparency.

<sup>14</sup>As a matter of routine, the Fiscal Transparency Unit of the IMF's Fiscal Affairs Department assigns all ROSC text to each element of the code. The practice of including specific code elements will be incorporated in future publications of fiscal ROSCs.

### 2.3.2 Aspects of Transparency Included

This paper develops four different sub-indices including data assurances, medium-term budgeting, budget execution reporting, and fiscal risk disclosure. The practices included in each cluster of fiscal transparency can be seen in Table 2.1. The second column in the table shows the correspondence between the practice considered and the relevant code element from the *Code of Good Practices on Fiscal Transparency*.

Before discussing the individual aspects of transparency, it may be useful to discuss the motivation behind the selection of aspects. A natural way of developing an index of transparency, based on the fiscal transparency code, would have been to classify each of the elements of the code separately and then use an aggregation method to calculate a summary index of fiscal transparency.<sup>15</sup> This method has several advantages as well as some disadvantages. The most appealing quality of this methodology is that it is comprehensive and would follow the code exactly. Sub-indices could be developed based on the four sections of the code. The problem with this methodology, however is that some elements of the code do not lend themselves easily to classification; also certain elements have several parts and using only one observation for them would ignore important information (discussed later).

The selection of different aspects of transparency was driven by three main criteria: earlier literature on fiscal transparency, information content/classification, and

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<sup>15</sup>Oxford Analytica does this for a small number of countries and the reports are available online Oxford Analytica (2004). The indices constructed in this paper are compared to this index in a later section.

Table 2.1: Fiscal Transparency Clusters

Cluster	Code <sup>1</sup>	Practices of Transparency <sup>2</sup>
<b>Data</b>	3.2.1	Budget Classification
<b>Assurance</b>	2.2.1, 2.2.2	Release of Data
	2.1.1, 3.2.1	Budget Coverage
	4.2.2	Independent Assessment of Forecasts
	4.1.1	Realism of Budget Estimates
<b>Medium-term Budgeting</b>	3.1.1	Policy Objectives
<b>Budget Execution</b>	2.1.2	Forward Estimates
	3.1.3	Projections guided by a Medium-term Economic Framework
	3.1.4	New Policy Costs
	3.1.5	Fiscal/Macro Risks
	3.3.1	Accounting System
<b>Budget Execution</b>	4.2.1	External Audit
	3.4.2	Final Accounts
	3.3.3	Internal Audit
	3.4.1	Mid Year Reporting
<b>Fiscal Risks</b>	2.1.3	Contingent Liabilities
	2.1.4	Debt
	2.1.3, 1.1.4	Quasi-Fiscal Activity - Financial
	2.1.3, 1.1.4	Quasi-Fiscal Activity - NFPE <sup>3</sup>
	2.1.3	Tax Expenditures

<sup>1</sup>The elements of the *Code of Good Practices on Fiscal Transparency* are labeled 1.1.1 to 4.2.3. These are the primary elements considered during classification, although in certain cases information from other parts of the ROSC was also used.

<sup>2</sup> See Appendix A.3 for description of the different practices.

<sup>3</sup>NFPE-Non-Financial Public Enterprises.

tractability. The earlier work on fiscal transparency includes Allan and Parry (2003), Alt and Lassen (2003), and IMF (2003). The starting point was IMF (2003) which identifies some key observations from fiscal transparency ROSCs and suggests four main areas of fiscal transparency that need attention: fiscal data quality, off-budget fiscal activity, clarity of tax policy and administration, and intergovernmental fiscal responsibilities. Some component indicators of a fiscal transparency index proposed in Alt and Lassen (2003) were also included.

There are some codes of good practice that are more descriptive in nature than assessments, which makes them difficult to classify. For example, consider code 3.1.2, which suggests that “Any fiscal rules that have been adopted ...should be clearly specified.” When discussing code 3.1.2, many ROSCs give a detailed description of the fiscal rules without actually assessing if the rule is clearly specified or if it is adhered to. Similarly, many of the codes, which deal with inter-governmental relationships and legal/administrative frameworks are more descriptive in nature and depend heavily on the constitutional set-up of the government (e.g. federation or sub-national division of authority). Although these issues are important and require further study, the current project excludes these aspects.

Some elements of the code have several distinct parts and using one observation for that element would ignore important information. For example, consider the code 2.1.3 which states that “Statements describing the nature and fiscal significance of central government contingent liabilities and tax expenditures, and of

quasi-fiscal activities should be part of the budget documentation.” Generally, the part of the ROSC reports that deals with this code discusses contingent liabilities, tax expenditures, and quasi-fiscal activities (QFAS) separately, and in many cases the governments deal with them differently. Coding these as one observation would ignore information, so instead I chose to classify these separately.

Finally, ROSCs are a rich source of information on fiscal institutions and can be used to answer a range of questions. In order to make the project more tractable, the number of aspects was limited to twenty. I recognize that the limit is somewhat arbitrary, but it is a high enough number to include much of the available information and at the same time keep the problem tractable. In a later section, I assess the robustness of the index and ranking to reducing the number of aspects at random. The analysis shows that although the inclusion/exclusion of aspects changes the rankings, majority of the times the ranking are close to the benchmark rankings, particularly on the extreme ends of the rankings. The methodology proposed in the paper is flexible so any revisions in the future could include more aspects of transparency and/or specific aspects could be analyzed to answer particular questions. For example, the information on fiscal policy rules could be classified by types of rules to study which types are most successful at disciplining budgets.

Instead of discussing the merits/demerits of including/excluding each of the codes of good practice, the next sections will describe each aspect of transparency and dis-

cuss its relevance.<sup>16</sup> The detailed description of each aspect of transparency generally includes the following components: a brief description; why it is important for fiscal transparency; actual text of the relevant fiscal transparency code; the coding table; and a discussion of the classification. In order to see how the methodology works, some examples from actual ROSCs are also included. Although the classification involves judgment, the results should be close if others follow the same methodology.

### **2.3.3 Data Assurances**

Even if a government publishes significant fiscal information, it is still possible for it to be considered non-transparent. Therefore, the first sub-index looks at “data assurances” (DAS), i.e. practices which improve the reliability and credibility of fiscal data.<sup>17</sup> For example, varying the definition of government or reclassifying revenue can hide the true extent of the deficit. Therefore, transparency can be improved by adhering to a uniform classification of data and using a widely accepted definition of government. These factors make it easier for those outside the government, such as civil society, investors, and policy analysts, to understand and analyze the budget.

#### *Release of Data*

Fiscal data should be released in a timely manner with sufficient detail and qual-

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<sup>16</sup>This section draws on the IMF (2001) “Manual on Fiscal Transparency” which should be referred to for more details.

<sup>17</sup>The accounting related reliability measures are discussed below under budget execution reporting.

ity. The best practice is to publish advance release calendars for fiscal data. This improves transparency because discretion in fiscal data release can damage a government’s credibility. With discretion, governments are likely to be more forthcoming with favorable news while choosing to delay release of unfavorable information. Therefore, by committing to a fiscal data release calendar in advance the government can improve credibility of its fiscal data. Adhering to a calendar would also make it easier for those outside the government to plan their assessments of government data and increase its usage.

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**Release of Fiscal Data**

2.2.1 The publication of fiscal information should be a legal obligation of government.

2.2.2 Advance release date calendars for fiscal information should be announced.

Category	Numerical
Fiscal data released on an ad hoc basis or not at all	0
Fiscal data released with a long delay or of poor quality	0.33
Fiscal data available in a timely manner and of good quality	0.66
In addition, advance release calendars are announced	1

---

Most of the countries in the sample have early release calendars for fiscal information. Many of the ROSCs note compliance with the Special Data Dissemination Standard (SDDS), which was established by the IMF in 1996 to guide countries that either have or might seek access to international capital markets in the dissemination of economic and financial data to the public. Although the coding table above is self-explanatory, it may be helpful to consider some examples.

For example, Philippines is assigned category “1” because of the following statement in the FT ROSC:

“As part of the commitment to the SDDS, the government publishes advance release date calendars for fiscal reporting . . . release-dates are usually adhered to . . .”

In contrast, Pakistan is assigned a “0.33” i.e. “Fiscal data released with a long delay or of poor quality” because of the following statements in the FT ROSC:

“Formal commitments for more regular publication of fiscal data have not yet been made. The lack of timeliness of fiscal data has not allowed much progress to be made toward meeting . . . GDDS, and no advance release calendar for fiscal statistics publication has been produced . . . The CBR data is already available on a monthly basis. . . . The federal government has adopted measures to address a significant breakdown of the processes of accounts reconciliation and fiscal reporting”

### Budget Classification

Budget classification refers to the classification of budgets according to functional, economic, and administrative categories. Uniform classification of the budget across sub-national levels of government and across categories, along with the use of a standard classification, makes it easier to get a clear picture of the budget, government priorities, and magnitude/effectiveness of government programs. The code requires that budget coverage and classification adhere to certain widely accepted standards on budget data such as the IMF’s Government Financial Statistics Manual (GFSM2001) or European Statistical Agency Standard (ESA95).

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### Budget Classification

3.2.1 Budget data should be reported on a gross basis, distinguishing revenues, expenditure, and financing, with expenditure classified by economic, functional, and administrative category...

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Category	Numerical
Only administrative classification or limited classification	0
Budget classification only partially consistent with GFS and data quality/availability concerns exist	0.33
Budget classification mostly consistent with GFS but some issues persist	0.66
Budget classification broadly consistent with GFS and presented	1

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In many countries, the classification system is usually an outcome of the historical development of the budget process and may not follow a widely accepted standard on fiscal data. This is particularly the case in many advanced economies. Consider Italy for example, which has a unique system based on detailed expenditure categories titled “unita previsionali di base” (UPB). Since Italy is part of the EU and is required to report data on ESA95 categories, it uses a bridge that can present the UPB based data according to the ESA95 requirements. Nevertheless, since the planning and implementation of the budget is based on the UPB system, Italy was assigned the “0.66” category although it publishes data according to ESA95.

For another example, consider Israel, which is assigned a “0.33” because even though it produces data based on GFSM2001, the data are not available at a detailed level. The ROSC also says that the presentation of the data could be made more useful. The category assignment is based on the following statements in the ROSC:

“The ABL includes broad functional, economic, and program classification that are considerably less detailed than those set out in the ... (GFS2001). ... The presentation of the budget documents could be made more user-friendly, and more useful from the point of view of assessing the effectiveness and efficiency of the government’s expenditure programs ...”

### Budget Coverage

Budget documents should cover all fiscal activity including extra-budgetary transactions and activities of autonomous agencies in order to provide a comprehensive picture of government finances. Lack of budget coverage can distort the picture presented by budget documents. The fiscal transparency code focuses on the central government, so in most cases the ROSCs discuss budget documentation of the central government. Although some ROSCs do refer to general government –particularly where significant fiscal activity is at the sub-national level– it is not done on a consistent basis. Therefore, I primarily focus on the comprehensiveness of the central government budget. Where the public sector is significant, as indicated by the ROSC, I also consider if the public sector is included.

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### Budget Coverage

2.2.1 The budget documentation, final accounts, and other fiscal reports for the public should cover all budgetary and extrabudgetary activities of the central government, and the consolidated fiscal position of the central government should be published.

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Category	Numerical
Limited coverage of fiscal activity (exclude extrabudgetary funds (EBFs), autonomous agencies, and public enterprises)	0
Partial coverage of fiscal activity (include some EBF, autonomous agencies, and public enterprises)	0.33
Adequate coverage (include most EBF, autonomous agencies, and public enterprises)	0.66
Comprehensive coverage of fiscal activity	1

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While categorizing this practice, I first looked for any clear statements regarding coverage. For example in the case of Poland, the ROSC states:

“The annual budget covers all central government operation in detail while activities of the extrabudgetary funds are appended as annexes to the state budget.”

This could have been categorized as “1” but the ROSC goes on to say that:

“... there is a separate budget for EU grants and cofinancing, these resources should be explicitly highlighted ... proliferation of extrabudgetary funds ... serves to complicate transparency ... autonomous agencies and units should begin reporting their gross activities to the ministry of finance (rather than merely their budget subsidy) ...”

Consequently, Poland was assigned a “0.66” despite the provision of adequate coverage since some concerns still remain, particularly with extrabudgetary funds (EBFs) and own-resources.

### Independent Assessment of Forecasts

As indicated earlier, one practice that reduces the transparency of budget is the problem of over-optimistic projection. A method to deal with this is to require that

macroeconomic and fiscal forecasts be published and independent experts be invited to assess these forecasts. This external scrutiny should improve the reliability of estimates and avoid surprises due to over-optimistic projections. Countries were categorized on two dimensions: publication of projections and if independent experts are invited to assess the projections.

<b>Independent Expert Assessment of Forecasts</b>		
4.2.2 Independent experts should be invited to assess fiscal forecasts, the macroeconomic forecasts on which they are based, and all underlying assumptions.		
<b>Published</b>	Not Published	Assumptions/forecasts published/available to public
<b>Independent Expert Oversight</b>		
No independent expert oversight	0	0.33
Independent expert assessment of fiscal forecasts	0	0.66
Independent expert assessment of fiscal forecasts + macro assumptions	0.33	1
Independent expert assessment of fiscal forecasts + macro assumptions + underlying assumptions	0.66	1

In many cases the International Financial Institutions including the World Bank and IMF provided the only independent assessment of projection. Most countries do not publish their underlying macroeconomic assumptions nor invite independent experts to assess the forecasts. Several ROSCs have noted that in many countries the lack of independent assessment may be a result of low capacity for analysis outside the government. For example, Albania is assigned “0.33” because although the ROSC indicates that:

“forecasts of selected macroeconomic indicators . . . are presented in the budget documents.”

It goes on to say that:

“. . . External scrutiny of macroeconomic and fiscal projections is permitted, but limited reflecting the absence of published assumption and methodology as well as institutional capacity constraints outside the government.”

### Realism of Budget Projections

This practice refers to how closely the budget data reflect the underlying economic realities. Realism of the budget projections makes it more likely that the budget is implemented as approved and highlights consistently over-optimistic or overly conservative budgets. A regular analysis of the realism of budget projections can also identify any changes needed to the budget within year in case of over spending or unlikely revenue targets.

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#### **Realism of Estimates**

4.1.1 Budget data should reflect recent revenue and expenditure trends, underlying macroeconomic developments, and well-defined policy commitments.

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Category	Numerical
Not reliable/realistic	0
Somewhat reliable/realistic	0.33
Mostly reliable/realistic	0.66
Reliable/realistic	1

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Many ROSCs contain clear statements of whether the budget data reflect the underlying economic trends. For example, Germany is assigned category 0.66, because although there is a clear statement in the ROSC that:

“Budget data are reliable, and the variance between the budget and actual outturn is a publicly disclosed, both for the main aggregates and the detailed budget items . . . the authorities tend to refrain from supplemental budgets.”

The staff commentary goes on to say that:

“The government should regularly evaluate the budget outturn within the year, and update the budget forecasts ...”

which suggests that the budget data within year may not reflect the underlying macroeconomic developments and revenue/expenditure trends.

### **2.3.4 Medium-term Budgeting**

The next cluster considered is the medium-term budgeting (MTBF). Government budgets are usually formulated on an annual cycle. However, to be meaningful and effective, the budgets must take into account factors outside the budget cycle, such as long-term investment plans, revenue trends, multi-year program costs, or macroeconomic realities. Medium-term budgeting framework (MTBF)<sup>18</sup> is a tool for better assessing, formulating, and implementing fiscal policy in the medium-term. Although an effective implementation of an MTBF requires a certain level of institutional sophistication, many governments have adopted a phased approach to establishment of MTBFs by taking steps such as improving forecasting, formulating budget objectives, and costing new programs. The proposed MTBF index attempts to capture the progress of this phased approach. The five issues considered in this sub-index are statement of fiscal objectives, forward estimates, identifying new policy costs, use of a medium-term quantitative economic framework, and statements of fiscal/macro risks.

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<sup>18</sup>See Allan and Parry (2003) and paragraphs 107-108 of the *Manual on Fiscal Transparency* for description of an MTBF.

### Policy Objectives

Since budgets are usually set in a multi-year framework, it is important that the government describe its medium-term policy objectives and assess fiscal sustainability. This is an integral part of the medium-term budgeting framework and allows for analysis of the link between a government's stated objectives and its actual budget. Since many policy options are limited by fiscal sustainability concerns, an assessment of sustainability should guide the annual budget.

<b>Policy Objectives</b>	
3.1.1 A statement of the fiscal policy objectives and an assessment of fiscal sustainability should provide the framework for the annual budget.	
Category	Numerical
Limited discussion of policy objectives in the budget documents	0
Policy objectives discussed but unclear/not published	0.33
Policy objectives discussed in general terms	0.66
Policy objectives clearly/precisely discussed and published in the budget documents	1

Countries, which are most likely to adhere to this practice, are those that have elaborate macroeconomic frameworks and carry out regular analysis of fiscal sustainability. Others include some broad statements of fiscal objectives but they are seldom discussed precisely in terms of effects on the budget. Consider Colombia, which is classified as “0.66” because though there is a statement of fiscal objectives and an analysis of fiscal sustainability, it lacks a clear statement of how the budget is related to the objectives/development plan. The exact quote from the ROSC states:

“Budget documentation specifies the objectives of fiscal policy and includes an evaluation of fiscal feasibility, but -does not strictly comply with the legal mandate to indicate how the budget adheres to the government’s development plan...”

*Forward Estimates*

Forward estimates are the budget estimates looking beyond the current budget year. These estimates give a medium-term outlook of the budget and provide a benchmark for budgeting in the following year. A commitment to publishing forward estimates and explaining any drastic changes to projections can also lead to more careful medium-term budgeting. Furthermore, forward estimates can improve transparency by reducing the uncertainty of resource requirements and available funding for agencies implementing multi-year programs.

<b>Forward Estimates</b>	
2.1.2 Information comparable to that in the annual budget should be provided for ...forecasts of the main budget aggregates for two years following the budget.	
Category	Numerical
Forward estimates not reported /No quantitative information available	0
Forward estimates not reported /Partial quantitative information available	0.33
Forward estimates partially reported	0.66
Forecasts of the main budget aggregates for two years included in the budget	1

The fiscal transparency code suggests that forward estimates at least two years ahead of the budget year should be included in the budget. Most countries include some forward estimate but lack details in the forward projections. As an example of state-

ment on budget projections consider Germany, which is classified as “1” due to the following statement in the ROSC:

“The budget document discloses the ...main aggregates for three years beyond the budget year”

In another example, Kazakhstan is classified as “0.33” because the ROSC observes that although it maintains forward estimates it does not make them public. The exact statement is:

“The budget document discloses ...no detailed forward estimates. From 2002, passports are to be maintained for all budget programs, but the forward estimate details are not at present published ...”

#### *Medium-term Economic Framework*

Since there is significant interaction between fiscal policy and other macroeconomic variables, it is important that the budget be guided by a quantitative macroeconomic framework. This improves transparency in several ways. It ensures that fiscal policies are consistent with broader medium-term macroeconomic developments and other policies as well as providing a justification for the budget choices. It also becomes easier to assess how closely the governments fiscal policies reflect its stated long-term policy objectives. Finally, an economic framework can help identify sensitivity of the budget to macroeconomic developments or other policy outcomes.

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### Medium-term Quantitative Macroeconomic Framework

3.1.3 The annual budget should be prepared and presented within a comprehensive and consistent quantitative macroeconomic framework, and the main assumptions underlying the budget should be provided

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Category	Numerical
No quantitative macroeconomic framework	0
Projections guided by a macroeconomic framework (limited/not medium term)	0.33
A medium-term macroeconomic framework used (but some issues exist)	0.66
Macroeconomic framework fully integrated into the budget process	1

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Although most countries use a macroeconomic framework, the extent of use and quality of frameworks differs considerably across countries. For example, in Iran, the ROSC notes that:

“... comprehensive macroeconomic framework is not updated at the start of the process ... [In essence, the TFYDP (Five Year Development Plan) serves to provide the medium-term budget framework. It is however, not a rolling forward-looking plan, being constrained within a fixed five-year timeframe of 2000-2004.] ... Although the MPO has a macroeconomic model, it is not used for setting key budget aggregates; projection of non-oil revenue and expenses ... are established after examination of the divergence of previous year's outcomes relative to TFYDP projections ...”

Based on this statement Iran was assigned category “0.33.” This category applies because the macro framework is used in a limited way to guide the non-oil projection and the framework itself [TFYDP] cannot be characterized as medium-term since it is not updated on a rolling basis.

#### New Policy Costs

The fiscal transparency code suggests that new policy costs should be clearly distin-

gushed from the existing program costs in the budget documents. This can improve fiscal transparency in several ways. For example, the practice of distinguishing between the costs of continuing policies and new policies can improve transparency by making it easier to assess the factors contributing to deviations between planned and actual expenditures. It also becomes easier to establish a more direct link between the government’s objectives and its budget proposal. Finally, considering the new policy costs separately may induce more disciplined budgeting.

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**New Policy Costs**

3.1.4 New policies being introduced in the annual budget should be clearly described.

Category	Numerical
Not reported (in budget)/No quantitative information available	0
Not reported (in budget)/Partial quantitative information available	0.33
Partially reported in budget	0.66
Comprehensively reported in budget	1

---

Although the government in many instances, describes new policies in budget presentation, these initiatives are rarely costed. In Papua New Guinea, for instance, the ROSC indicates that:

“New initiatives are described in the budget speech. There is however, no systematic summary statement in the budget documents of the estimated fiscal effects of all new policies ...”

So it is assigned “0.” In other cases, only partial information is available or only available within the government. Slovak Republic is assigned category “0.33” because the ROSC states that:

“Estimates of new initiatives are clearly distinguished in the budget preparation but not in the budget documents.”

### Fiscal/Macro Risks

Although the budget projections provide a good faith estimate of the expected revenue and expenditure, to get an accurate picture of the fiscal position and future fiscal stance it is also important to get an estimate of the uncertainty associated with these budget estimates. Therefore, the fiscal transparency code suggests that major fiscal risk should be analyzed and reported where possible.

The good practice here is to include a statement of fiscal risks with the budget that lists such items as robustness of budget estimates to macro-economic assumptions, any near-future policy commitments being considered, or uncertainty about size of different expenditure programs. The practices on reporting of fiscal risks are coded using the following table.

<b>Fiscal Risk</b>	
Major fiscal risks should be identified and quantified where possible, including variations in economic assumption and the uncertain costs of specific expenditure commitments (e.g. financial restructuring).	
Category	Numerical
No fiscal risk analysis	0
Limited analysis and reporting of fiscal risks (e.g. lists)	0.33
Somewhat adequate analysis and reporting of fiscal risks	0.66
Comprehensive analysis and reporting of fiscal risks	1

Many ROSCs have clear statements indicating whether the budget documents include an analysis of sensitivity of budget estimates. Some countries identify sources of risk such as weather or economic outlook, but very few include estimates of the sensi-

tivity. In general, the practice of including fiscal/macro risk assessments is limited to the advanced economies. Many of the EU accession countries have improved reporting on fiscal risks because of the EU planning requirements. Take Estonia for example, which was assigned category “0.33” because of the following ROSC statement:

“Analysis of sensitivity of the budget estimates to economic and fiscal risks is being developed but not yet included in the budget. The PEP documents prepared for the EU include an analysis of the impact of growth and interest rates on projected budget aggregates, but this analysis is not presently included in budget paper.”

### **2.3.5 Budget Execution**

Disciplined budget management is a crucial requirement for transparency and problems at the budget execution (BEX) stage can make any budget useless. An effective accounting system is a crucial part of budget execution. In addition, the sub-index incorporates issues such as effectiveness of internal audits and external audits. In order to monitor the implementation stage, practices on mid-year reporting and publication of final accounts are also included.

#### *Accounting System*

An effective accounting system is a fundamental requirement for transparency because it allows for recording of all government activity and establishes internal control to generate reliable budget execution data. In the actual ROSCs, various observations are made about the state of accounting system ranging from ineffective accounting systems to fully integrated accounting systems that are able to produce reliable es-

timates of arrears. An assessment of payment arrears is crucial because they pose a fiscal risk to the government and can be used to distort the fiscal position of the government.

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### Accounting System

3.3.1 There should be a comprehensive, integrated accounting system which provides a reliable basis for assessing payment arrears.

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Category	Numerical
Ineffective accounting system/Reports not produced regularly	0
A working (not fully integrated) accounting system which produces some (low quality) data	0.33
Integrated accounting system which produces reliable budget execution data	0.66
In addition, the accounting system can produce reliable arrears data	1

---

To see an example of classifying practices on accounting systems, again consider Estonia, which is classified as “0.66” because it has an effective accounting system; but it is not clear if it can produce reliable estimates of arrears yet, although the ROSC notes that improvements are in progress. The ROSC mentions that:

“Accrual accounting has been adopted for ministries and agencies reporting on 2001, but the aggregate budget is still prepared on a cash basis. The Estonian government is relatively advanced in its accounting practices ... The accrual accounts cover only expenditures at this stage and cannot be systematically consolidated into a reliable balance sheet ...”

### *External Audit*

A functioning external audit system is a basic requirement for transparency and an essential tool for assuring public accountability. In addition, the audit can also attest to compliance with regulations and statutes. Although external audit authorities

exist in most countries, their effectiveness varies considerably. To be effective, it is important the audit authorities be independent of the executive and report directly to the legislature. The audit authority should also be provided with sufficient resources to effectively fulfill its mandate. Finally, the effectiveness of the audit function is heavily dependent on the follow up to the external audit report by the legislature. One method for thwarting external audit authorities has been to prevent presentation of the audit reports to the legislature or to the public. Therefore, the focus of categorizing practices on external audit was on four issues: independence, follow-up, quality of audit, and available resources. The following table shows the different categories used and the numerical categories assigned.

<b>External Audit</b>	
4.2.1 A national audit body or equivalent organization, which is independent of the executive, should provide timely reports for the legislature and public on financial integrity of government accounts.	
Category	Numerical
Not independent / weak or no follow up / lack resources	0
Independent / strengthening of audit capacity needed / no follow-up / resource constraints	0.33
Independent / sound external audit/ weak follow up / sufficient resources	0.66
Independent / sound external audit / effective follow-up / sufficient resources	1

The fiscal transparency code suggests that external audit practice should adhere to certain international standards, like those set by International Organization of Supreme Audit Institutions (INTOSAI). Very few ROSCs address this issue but do

note the historical genesis of the external audit system and make statements about its effectiveness.

For example the Czech Republic is assigned the category “0.66” which is “In-dependent / sound external audit/ weak follow up / sufficient resources” because of the following statements in the ROSC (note that judgments by author the are *emphasized*):

“The Supreme Audit Authority (SAO) audits the government accounts on an ad hoc basis and provides a report to the Parliament and the Cabinet . . . The SAO performs high quality auditing [*Sound external audit*]. The responsibilities of the SAO are mandated in the Constitution and its head is appointed by the President and approved by the Parliament. [*Independent*] . . . There is no formal mechanism to follow up its recommendations. The SAO produces a quarterly report of its findings that is available to the public.[*Weak follow up*]”

### *Final Accounts*

Presentation of the audited final accounts to the legislature is an essential measure to assess the accountability of public finances. The code suggests that final accounts should be presented to the legislature and published within the following fiscal year. Final accounts should demonstrate compliance with budget, show major causes of deviations, and present an audited fiscal position of the government. Although most countries have management systems to produce final accounts, several countries have weaknesses in the system, which have resulted in no final accounts being prepared or prepared with a long lag.

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**Final Accounts**

3.4.2 Final accounts should be presented to the legislature within a year of the end of fiscal year.

<b>Final Accounts Prepared</b>	Not prepared	Partially prepared	Fully prepared
<b>Presented</b>			
Not presented/not presented within year	0	0	0
Presented sometimes within year (or unclear)	0	0.33	0.66
Always presented within year	0.33	0.66	1

As the table above shows, this aspect is coded for two questions: first, if the final account are prepared; and second, if these accounts are presented to the legislature in a consistent and timely manner, i.e. within a year of the end of the fiscal year. Countries were assigned the middle category for each dimension where it was not exactly clear which of the higher categories applied. In the case of Ghana for instance, the ROSC indicates clearly that final accounts are publicly available but it does not make any statements about the comprehensiveness or quality of the accounts. So, Ghana is assigned the category “Partially prepared”. The Ghana ROSC goes on to say:

“They are routinely presented to the Parliament well in excess of the constitutional provision . . . of six months after the end of the fiscal year. The last audited set of Final Accounts submitted to Parliament was for 2000 financial year. Since then, public accounts for 2001 and 2002 have been prepared but not yet audited.”

Based on this observation Ghana is assigned the category “Not presented/not presented within year” for the presentation dimension resulting in an overall classification of “0.”

### Mid-Year Reporting

Within year reports are an important tool for in-year monitoring of budget implementation and fiscal position. Any discrepancy between the planned and actual within year outcomes should be explained and revenue and expenditure estimates should be updated to reflect the recent economic trends. This would present a more transparent picture of the governments current fiscal position and the expected budget out-turn. It is important that this mid-year report be presented to the legislature and public so any changes can be discussed transparently and budget out-turn is not a complete surprise to those outside the government.

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#### **Mid-year Report**

3.4.1 A mid-year report on budget developments should be presented to a legislature. More frequent (at least quarterly) reports should also be published.

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Category	Numerical
No mid-year report to legislature	0
Ad hoc reports to legislature/Not comprehensive	0.33
At least mid-year report to legislature (Not published)	0.66
At least mid year report to legislature and published	1

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It is a usual practice for countries to produce quarterly or even monthly reports on budget implementation but few have formal reviews of a mid-year report by the legislature. In many cases, there is an ad hoc review by the legislature to address circumstances requiring a change in budget. As an example, consider Sri Lanka, which is assigned category “0.33” because the ROSC Commentary says:

“A transparent system for intra-year adjustments to the budget should be developed. Instead of ad hoc supplementary budget appropriations, a mid-session review of the budget should be introduced, supported by a detailed compilation and dissemination of information on year-to-date budget execution.”

### Internal Audit

Internal audit refers to audit by staff within a spending agency or by staff from ministry of finance or another executive body. Every agency should be able to account for use of public funds and have effective internal control procedures. The fiscal transparency code requires that budget execution should be internally audited and audit procedures should be open to review.

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#### **Internal Audit**

3.3.3 Budget execution should be internally audited, and audit procedures should be open to review.

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Category	Numerical
No or weak internal audit	0
Somewhat effective internal audit	0.33
Effective internal audit but some issues persist	0.66
Effective internal audit with audit procedures open to review	1

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Many ROSCs make clear statements about effectiveness of internal audit. For example in the case of Ghana, the ROSC states:

“Steps have been taken to establish internal audit units throughout the public sector and to provide them with capacity and resourcing necessary for effective internal audit functions . . . It is too early yet to assess the resourcing available to, or effectiveness of, this initiative.”

Based on this statement Ghana was assigned “0” - “No/weak internal audit.” The main difference between the last two categories, “1” and “0.66” is that the ROSC

indicates openness of internal audit and publication of internal audit reports.

### **2.3.6 Fiscal Risks**

Finally, a measure of disclosure of fiscal risks (FR) is also considered. There are several sources of fiscal risk that can affect a government's fiscal position by either increasing its obligations or reducing its resources. Requiring the government to publish information on possible sources of risk would present a more accurate picture of the fiscal position, improve credibility of the government by reducing uncertainty regarding its fiscal position, and may prod the government to reduce sources of risk. The sources of fiscal risk considered include contingent liabilities, debt, and quasi-fiscal activity.<sup>19</sup>

#### *Debt Reporting*

Government debt is an important indicator of the government's fiscal position and sustainability. Unsustainable levels of debt or structure of the debt can lead to drastic fiscal adjustments; therefore, it is important that governments regularly report debt figures.

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<sup>19</sup>Quasi-fiscal activities, such as directed lending or subsidized loans in the current period, may lead to losses/recapitalization in future.

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### Debt

2.1.4 The central government should publish full information on the level and composition of its debt and financial assets.

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Category	Numerical
Not published/No comprehensive quantitative information available	0
Not published/Partial quantitative info available (e.g. with-in government)	0.33
Partially published	0.66
Comprehensively/Detailed published	1

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The practices on reporting of debt information vary considerably across countries. In general, the reporting on external debt is better than that on domestic debt. Some ROSCs also comment on availability of information on debt arrears, but this is not done on a consistent basis. Few ROSCs also discuss issues related to sub-national governments such as limits on sub-national borrowing, implied guarantees of sub-national debt, and consolidation of sub-national debt in aggregate debt figures. The following examples show how practices of debt reporting were classified.

Bangladesh is assigned category “0.66” i.e. “Partially published” because of the following statement in the ROSC:

The ERD compiles and disseminates comprehensive annual data on external government debt, but data for domestic debt are produced by the MOF for internal government use only ...”

Azerbaijan is assigned “0.33” i.e. “Not published/Partial quantitative information available)” because of the following statement in the ROSC:

“Even though the treasury produces monthly detailed reports on ... debt, and loans including government guaranteed loans, none of this information is published”

The coding table below is used to classify practices on reporting of contingent liabilities, quasi-fiscal activities (QFAs) and tax expenditures. The description of the individual practices will follow this brief discussion of the coding table. Each of these practices is classified along two dimensions, reporting and extent. Therefore, if we were considering QFAs, we would need to classify the extent of QFAs and the reporting of QFAs.

<b>Off-budget Activity/Fiscal Risks</b>			
The following table is used to classify practices in incidence and reporting of contingent liabilities, quasi-fiscal activity, and tax expenditures.			
<b>Extent</b>	Prevalent	Somewhat prevalent	Limited
<b>Reporting in budget</b>			
Not reported/No quantitative information available	0	0	0.66
Not reported/Partial quantitative information available	0	0.33	0.66
Partially reported	0.33	0.66	1
Comprehensively reported	0.66	1	1

The practices on reporting in the budget can vary from “no reporting” to “comprehensive reporting”. If countries do not report or collect information on the relevant issue, they are assigned the category “Not reported/No quantitative information available”. For those countries that do not report, there is a possibility that they may still record the information but have decided not to make that information public. The information may be available in the ministry of finance or elsewhere within the

government. These cases are assigned “Not reported/Partial quantitative information available.” Others may only publish partial information or may only publish lists without quantities, in which case they are assigned the category “Partially reported.”

Similarly, the extent is difficult to assess, particularly if the authorities are not reporting them in the budget documents. ROSCs generally do not include any quantitative information such as total contingent liabilities or estimated QFAs. But many of the ROSCs include qualitative language such as “limited” or “prevalent” when discussing these practices. In cases where it was not possible to determine the extent, the countries were classified as “somewhat prevalent”.

Countries which have limited reporting and prevalence are assigned the category “0.” Countries which are classified as limited and practices on reporting are better, are assigned category “1.” The numerical categories take into account the fact that some information may not be published because it is not relevant for the country. For example, countries where contingent liabilities are not reported, but still limited, are assigned the same numerical category as countries where contingent liabilities are prevalent but are still comprehensively reported.

### *Contingent liabilities*

These are costs which the government will incur if a particular event occurs, examples include loan guarantees, indemnities against certain risks, uncalled capital, or legal action. Contingent liabilities are a major source of fiscal risk because they can drasti-

cally affect the fiscal balance if many contingent liabilities become actual obligations. Contingent liabilities are not recognized in the balance sheet as liabilities because they only become liabilities if certain events occur. Government guarantees to various financial and non-financial public enterprises are a common contingent liability, where in case of default, the government is called upon to cover the loan amount.

The code suggests that governments should take stock of the contingent liabilities and publish that information with its budget documents. The relevant code is 2.1.3 which suggests that “Statements describing the nature and fiscal significance of central government contingent liabilities . . . should be part of the budget documentation.” There are several ways to present a reasonable picture of the fiscal impact of contingent liabilities. Ideally, an actuarial estimate of fiscal risk posed by contingent liabilities should be included in the budget. This requires estimating the probability of contingent events (such as probability of a guarantee being called in) and the anticipated costs. This is not an easy task, since it is difficult to determine the a priori probability of a contingent event such as failure of a guaranteed enterprise. Further, liabilities such as indemnities and legal suits are difficult to quantify in advance. A more limited solution would be to present a statement on the value of all the quantifiable contingent liabilities, such as guarantees and a statement of the amount of total guarantees that had been called, in the previous fiscal year. Including this data in the budget document would give some idea of the risk posed by contingent liabilities and lead to discussion about how best to deal with them.

In order to apply this methodology, information is needed on both reporting of contingent liabilities and their extent. It is clear that assigning a category is not a simple task, given the various possibilities described above. In order to see how the methodology works in practice, the next section discusses classification of practices on contingent liabilities in Brazil and the Czech Republic.

Brazil was assigned the category “1” because it comprehensively reports its contingent liabilities which are limited. The “limited” assessment come from the following statement in the FT ROSC:

“The Fiscal Risks Annex of the LDO also discusses the contingent liabilities associated with public guarantees, and provides the value of outstanding guarantees, which traditionally have been small”

Similarly, on reporting, Brazil is assigned the category of “Comprehensively reporting” in budget based on the following statement in fiscal ROSC:

“Information is provided on contingent liabilities . . . . As indicated above, the LDO includes detailed annexes on the securitization of unfunded liabilities incurred in the past, as well as a fairly detailed assessment of the contingent liabilities that may arise in the future (Fiscal Risks Annex).”

Based on its FT ROSC, the Czech Republic was assigned category “0.66” because contingent liabilities were deemed to be “prevalent” and there was “comprehensive reporting” in the budget. The “prevalent” classification comes from the following statement in the ROSC:

“In 1998, the hidden liabilities were estimated to be around 13 percent of GDP, and the World Bank and the government estimate that they are expected to grow at a very fast rate.”

On reporting, the Czech Republic is assigned category “comprehensively reported” based on the following statement in the ROSC:

“In 1998, the government began publishing information in the budget on the outstanding value of state guarantees granted by the MOF and other agencies. ...The government has taken steps to be transparent about the size of the problem by providing an inventory of its hidden debt, but it has not yet developed a clear policy initiative to deal with the problem.”

### Quasi-Fiscal Activity-Financial and NFPE<sup>20</sup>

This section will discuss QFAs in the financial sector and NFPEs together, although they are classified as separate practices in the indices. QFAs in the financial sector include subsidized lending, loan guarantees, credit ceilings, and multiple exchange rates. QFAs in the financial sector pose fiscal risks because they weaken the financial institutions and may lead to higher future expenditure due to bailouts and recapitalizations. Prevalent QFAs are also indicative of underlying institutional weaknesses, which may lead to fiscal or financial vulnerabilities. QFAs can also misrepresent the size of government and its financial position. QFAs in the NFPE include such practices as subsidized goods or services, cross-subsidization, and minimum prices for suppliers. QFAs in NFPEs also distort the size of government expenditure, and pose fiscal risk because they may lead to losses at NFPE, requiring direct budgetary support in the future.

QFAs are discussed in two elements of the fiscal transparency code. 1.1.4 states that “Relations between the government and nongovernment public sector agencies (i.e. the central bank, public financial institutions, and nonfinancial public enterprises) should be based on clear arrangements.” Code 2.1.3 suggests that “Statements describing the nature and fiscal significance of central government . . . quasi-fiscal ac-

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<sup>20</sup>NFPE - Non-financial public enterprises

tivities, should be part of the budget documentation.”

Countries generally have better practices on reporting/extent of QFAs in the financial sector than in NFPEs. Many of the ROSCs when discussing financial QFAs focus on the central bank and any other major public financial institutions. There is a detailed description of the relationship between the central bank and the government. Many ROSCs contain clear statement about reporting of QFAs but few make qualitative statements regarding extent of QFAs, although they include a rich discussion of NFPEs or PFIs that carry out QFAs.

As an example consider Slovenia, where there is a clear statement that:

“There are no indications of any substantial quasi-fiscal activities. . . .No statements on . . . quasi-fiscal activities are included in the budget documents.”

So Slovenia is assigned “Limited” and “Not reported” which is category 1.

### Tax Expenditures

Tax expenditures include exemptions from the tax base, allowances, tax credits, tax rate reductions, and tax deferrals. These are considered expenditures because they reduce the potential tax revenue and would have the same impact if the government collected those taxes and then gave direct transfers. Tax expenditures reduce transparency because they distort the size of government revenue and expenditure. Further, since the impact of tax expenditure is not generally included in the budget they are not regularly reviewed in the budget process. The fiscal transparency code 2.1.3 suggests that “Statements describing the nature and fiscal significance of central

government . . . tax expenditures . . . should be part of the budget documentation.”

For example, Hungary is assigned “0.66” because although tax expenditures are partially reported, the ROSC does not clearly state if tax expenditures are prevalent or limited, so it is assigned the category “Somewhat prevalent/No info” for reporting.

The ROSC says:

“The report on the budget outturn provides partial information on tax expenditures . . . The MOF also compiles periodic reports in the context of EU accession process that document various forms of state aid, including tax expenditures . . .”

## 2.4 Construction of Fiscal Transparency Indices

Now that I have described how the different practices of transparency were categorized, this section will discuss how the summary indices were constructed. The problem in general terms can be stated as follows: we have indices  $t_{i,j} \in [0, 0.33, 0.66, 1]$  where  $i$  is an index over the 20 practices of transparency for country  $j$ . We need to define an operator  $M$  to construct a summary index:

$$T_j = M(t_{i,j})$$

for all  $i$  and  $j$ . There is a vast literature available for choice of operator  $M$  but a detailed discussion of this literature is beyond the scope of this paper.<sup>21</sup> The options can range from a simple linear function such as sum of the individual aspects to more complex options such as principal component analysis (PCA). Each method has its advantages and disadvantages, for example the appealing property of PCA method is

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<sup>21</sup>See European Commission (2002) for a recent review of composite indicator literature.

that it uses the statistical properties of the individual indices to construct the most informative summary index (i.e. with the highest variance) by reducing the weights on indices which are highly correlated. One of the disadvantages of this approach is that it is difficult to determine ex-post the weights assigned to different aspects.

### 2.4.1 Calculation of Indices

For the sake of simplicity, I chose to limit myself to linear operators of the form:

$$T_j = \sum_{i=1}^N w_i * t_{i,j}$$

Even this simple form of the operator  $M$  can yield many different indices. For example if we let  $w_i = 1$  for all  $i$  then the summary index  $T_j$  just becomes the sum of all the individual aspects being considered. However, in some cases, no information was reported for certain aspects, so they were noted as missing. These countries by definition would get a lower index value, which may or may not be justified.

In earlier studies of transparency, ad hoc weights have been assigned to different indices of transparency based on the author's judgment as in Alt and Lassen (2003) and Cukierman (1992). Although there may be valid arguments for why one aspect of transparency may be more important than another, here I take the agnostic approach and assign equal weights to all aspects included. Other indicators which use equal weights include the "Composite Leading Indicators" by the OECD and the "Summary Innovation Index" by the European Union.<sup>22</sup> This approach has the appealing quality

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<sup>22</sup>Some implications of choosing different weighting schemes or functions are discussed in the next

that countries with missing observations are not automatically penalized with lower values, the interpretation being that the missing values are replaced with the average of the rest of the aspects. The overall summary indicator is calculated as:

$$T_j = \sum_{i=1}^N (1/N) * t_{i,j} \quad (2.1)$$

where  $N$  is the number of non-missing aspects of transparency. The sub-indices are calculated similarly as means of their respective components listed in Table 2.1. The individual sub-indices are highly correlated, implying that better practices in one area of transparency are associated with better practices in other areas as well. This can be seen more clearly in the correlation matrix (Table 2.2) with almost all correlations greater than 0.50.

Table 2.2: Correlation among Indices of Fiscal Transparency

	FT	DAS	MTBF	BEX
DAS	0.87			
MTBF	0.83	0.64		
BEX	0.82	0.66	0.49	
FR	0.88	0.69	0.66	0.66
FT - fiscal transparency				
DAS - data assurances				
MTBF - medium-term budgeting frameworks				
BEX - budget execution reporting				
FR - fiscal risks				

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section.

## 2.4.2 Robustness of the Index

This section will discuss some implications of my choice of aggregation methodology. There are five main sources of uncertainty associated with the construction of the summary index: weighting of different aspects, inclusion of certain aspects, number of categories assigned, aggregation/composite methodology, and assessment of category. Not much can be done about the actual assessment based on the textual information. One possible test may be to see if others make similar assessments given the same information and methodology.

To address the first two types of uncertainties, weighting scheme and inclusion or exclusion of certain aspects, I recalculated the summary index using randomly generated weights.<sup>23</sup> The simulated summary indices are then compared to the benchmark index (calculated using equal weights). Certain results of these simulations can be seen in Panels 1 to 3 of Figure 2.1. In addition to the recalculation of the index for each iteration, the country is also assigned a rank, based on ordering of the index values. Panel 1 shows the range of rank, mean of rank, and the 95 percent confidence interval (calculated assuming normal distribution). The correlation between the benchmark rank and the mean rank is close to 1. The confidence intervals are small with little overlap between high and low ranking countries. The maximum and minimum ranks are also indicative of robustness of the ranking, since for many low

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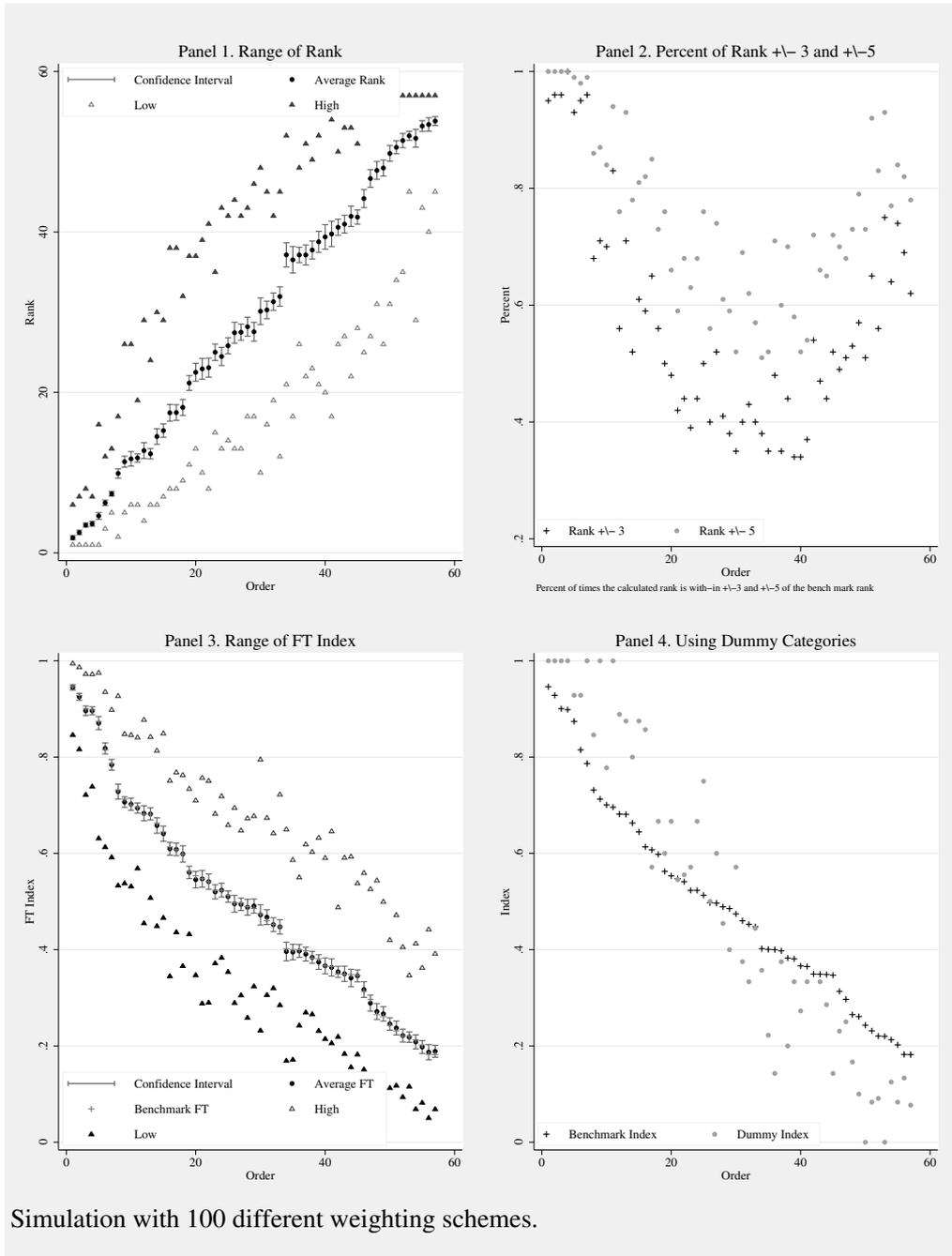
<sup>23</sup>The random weights are generated by first drawing a list of 19 uniformly distributed numbers and adding 0 and 1 to the list. Sort the numbers from lowest ( $n_1$ ) to highest ( $n_{21}$ ) then let  $w_i = n_{i+1} - n_i$  for  $i = 1$  to 20.

ranked countries the highest rank is lower than the lowest rank for some of the high ranking countries.

Another way to look at the robustness of the ranking is to consider the percentage of times the rankings are within a range of the benchmark rankings. For example, Panel 2. of Figure 2.1. shows the percent of times the simulated rankings are within  $\pm 3$  and  $\pm 5$  ranking of the benchmark ranking. It is clear that the highest and lowest ranks are fairly robust with 80 percent of the simulated ranks within 5 ranks of the benchmark ranks. The rankings in the middle are more dependent on the weighting scheme and vary significantly from the benchmark ranking. Panel 3. of Figure 2.1. present the range, mean, and 95 percent confidence interval for the simulated summary indices. The average of simulated indices is very close to the benchmark index value with a correlation coefficient slightly less than 1. The confidence intervals around the mean are small with little overlaps, at least for the high and low range.

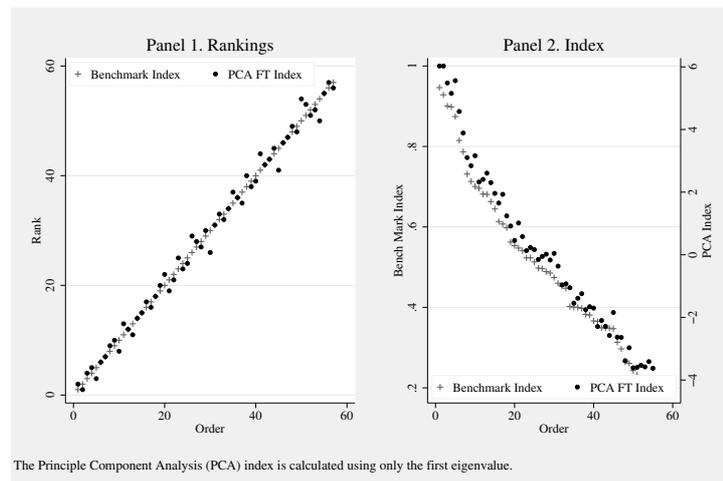
In order to show the sensitivity of the index to the number of categories, the overall index was recalculated using a dummy variable instead of four (0, 0.33, 0.66, 1) categories. The dummy variable is assigned “0” if the category is “0” or “0.33” and “1” otherwise. Then the index is calculated using equal weights as described in Eq. 2.1. Panel 4. of Figure 2.1 compares the benchmark index to the dummy index. The two indices are highly correlated with a correlation coefficient of 0.95. As can be expected, there is some bunching of index values particularly at the high end of

Figure 2.1: Robustness to Random Weighting Schemes



the index with many countries at 1. The dummy index also has a higher standard deviation since the index values at the high and low end are nearer to the extremes (0,1). Although the actual numbers are different, both indicators arrive at similar rankings particularly when distinguishing between high and low transparency. This is evidenced by the fact that in only 9 cases did the ranking change more than 5 places between the two methods.

Figure 2.2: Example: Using PCA to Calculate Index



As an example of using a different aggregation strategy, I compared the benchmark index to one calculated using principal component analysis (PCA).<sup>24</sup> For illustrative purpose, I calculate the PCA index using only the highest eigenvalue of the covariance matrix. Since PCA requires that no values are missing, the missing values were replaced with means of the non-missing values for each country. Panel 2. of Figure. 2.2 compares the values of the two indices. PCA index ranges from -4.5 to 6 and is

<sup>24</sup>See NIST/SEMATECH (2005) for a review.

plotted on the right axis; the two indices track each other closely with a correlation coefficient close to 1. Panel 1. of Figure. 2.2 shows the rankings based on the two different methods, and clearly, they yield very similar results.

This section considered the robustness of the index to various choices in the construction of the index. The purpose was to demonstrate that despite its simplicity, the benchmark index calculated as an average of the different aspects results in ranking and values similar to other choices of methodology.

## 2.5 Features of the Fiscal Transparency Indices

The transparency of fiscal institutions varies considerably between countries with the actual index ranging from 0.95 to 0.18. The most transparent countries are also the more advanced economies such as Canada, the United States, and Germany. This is not surprising, since many of the practices in the *Code of Good Practices on Fiscal Transparency* were drawn from practices in advanced economies. Several advanced economies have also made conscious efforts to make transparency a cornerstone of fiscal policy. On the other side of the spectrum are countries such as Malawi, Nicaragua, and Bangladesh, which have some of the least transparent practices in our sample.<sup>25</sup>

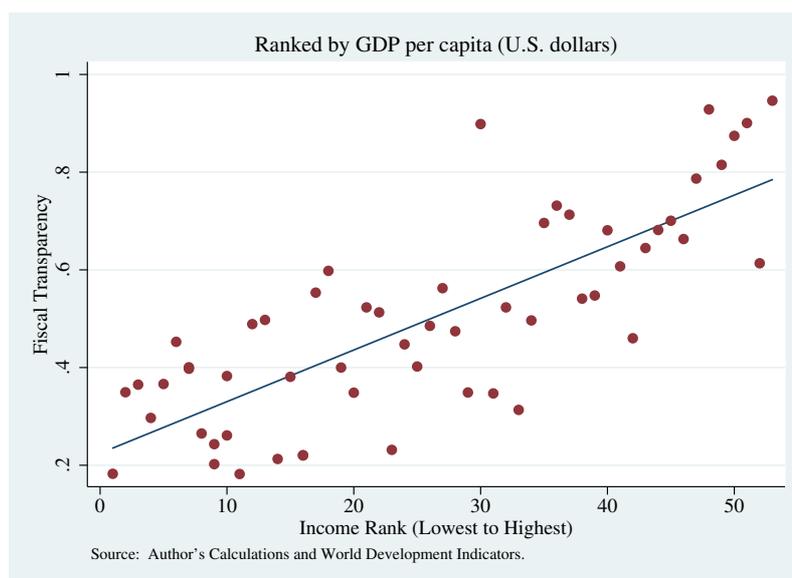
The sample of countries on the extremes suggests that transparency may vary

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<sup>25</sup>It is important to note that this study only covers countries that have volunteered for a Fiscal Transparency ROSC.

systematically with income. Figure 2.3 plots the fiscal transparency against an index of countries sorted by current GDP per capita in U.S. dollars. It is clear that countries that rank higher in wealth are also more transparent.<sup>26</sup> A bivariate regression between fiscal transparency and income tells a similar story with a statistically significant positive coefficient. This finding is in accordance with earlier studies of institutions<sup>27</sup> that invariably found a positive correlation between various measures of institutional quality and cross-country differences in GDP per capita.

Figure 2.3: Income Rank and Fiscal Transparency



Transparency is likely to be correlated with income because higher transparency may be an indicator of more developed institutions, which may be a consequence of greater resources available in richer countries. This paper makes no assertions

<sup>26</sup>The paper takes no stance on causality between income and fiscal transparency since there are considerable endogeneity issues and many common drivers for both of these variables.

<sup>27</sup>See IMF (2003).

on causality, because it is just as likely that many of the emerging markets have strong economic and political ties with the advanced economies, and are more likely to adopt best practices, regardless of their wealth. For example, many of the new EU members adopted several of the transparency related practices as part of the EU accession requirements.<sup>28</sup>

### 2.5.1 Comparison to Earlier Indices

With the increasing interest in fiscal transparency, some organizations such as the International Budget Project (IBP) and Oxford Analytica have started to develop fiscal transparency indices. Comparing the summary index developed in this paper with other indices can provide a check for the methodology. Moreover, it can demonstrate the robustness of transparency results across different measures of fiscal transparency. Table 2.3 shows estimates for relationships between these indices and the FT index based on fiscal ROSCs.

The IBP (2004), in a study of budget openness, developed different indices based on a detailed survey submitted to their affiliated organizations. These include an index on availability of executive budget documents (BUDDOC) and an index on availability of monitoring and evaluation reports (MONEVL). There were 21 overlaps between the IBP sample and the ROSC sample. As can be seen in Table 2.3, each of the IBP measures is positively and significantly related to the summary fiscal

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<sup>28</sup>See Allan and Parry (2002) for fiscal transparency in EU accession countries and the correspondence between EU accession requirements and the fiscal transparency code of best practices.

Table 2.3: Other Fiscal Transparency Indices

	(1)	(2)	(3)	(4)
	International Budget Project <sup>1</sup>			Oxford Analytica <sup>1</sup>
	BUDDOC	MONEVL	BUDDOC	
FT	0.59 (0.21)**	1.00 (0.26)***		0.47 (0.10)***
DAS			0.45 (0.16)**	
Obs.	21	21	21	13
R <sup>2</sup>	0.25	0.40	0.26	0.65

Standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
<sup>1</sup> Other indices rescaled to 1.  
FT - fiscal transparency index, DAS - data assurances sub-index.  
BUDDOC -availability of executive documents (IBP)  
MONEVL - availability of monitoring and evaluation reports (IBP)

transparency (FT) index. Since the BUDDOC variable poses a question similar to the data assurances (DAS) sub-index, the relationship between the two is also tested and found to be positive and significant.

Oxford Analytica (2003) developed a fiscal policy transparency index as part of a report prepared for CalPERS (California Public Employees' Retirement System). Many of the Oxford Analytica observations are based on fiscal transparency ROSCs and other ROSCs, so one would expect a high correlation between the two indices. There were 13 overlaps between the two studies and a bivariate regression shows that the Oxford Analytica measure is indeed positively related to the summary fiscal transparency (FT) index developed here.

## 2.5.2 Cross-country Comparisons

This section presents cross-country comparisons of the summary fiscal transparency index and the sub-indices. These comparisons can serve two purposes: first, to provide a further check on the index construction methodology by comparing earlier findings on fiscal transparency (based primarily on qualitative analysis) across groups of countries, and second, the comparison can suggest some new findings that can be explored further.

As can be seen in Table 2.4, the advanced economies as a group have higher fiscal transparency than the rest of the economies. Amongst the advanced economies, the highest transparency was observed in the United States and Canada. In the group of non-advanced economies, there was more variation with the highest value for Brazil and lowest value for Malawi. Although there is variation within the groups, a t-test for equality of means with unequal variance rejects the null hypothesis of equal means. A one sided test also confirms that the average transparency is greater in more advanced countries. A similar result arises when emerging markets are compared to other non-advanced economies.

The EU accession countries (many of them now new members of the EU) experienced significant institutional changes in order to meet the requirements for EU accession.<sup>29</sup> These changes led to the adoption of many best practices in fiscal transparency, which placed the EU accession countries ahead of other non-advanced economies in

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<sup>29</sup>See Allan and Parry (2003).

Table 2.4: Cross-Country Comparison of Fiscal Transparency

	N	FT <sup>1</sup>	DAS	MTBF	BEX	FR
All	57	0.50	0.55	0.48	0.54	0.43
Advanced Economies	11	0.76	0.77	0.76	0.79	0.74
Other	46	0.43	0.49	0.41	0.48	0.36
	(Excluding Advanced Economies)					
Emerging Markets	12	0.56	0.63	0.55	0.63	0.45
Other	34	0.39	0.44	0.36	0.43	0.32
EU Accession	11	0.58	0.72	0.52	0.61	0.48
Other	35	0.39	0.42	0.38	0.44	0.32
Latin America	8	0.49	0.48	0.40	0.65	0.40
Other <sup>2</sup>	27	0.36	0.41	0.37	0.38	0.29
HIPC	13	0.32	0.29	0.43	0.31	0.26
Other <sup>3</sup>	15	0.36	0.46	0.26	0.45	0.28

N - number of countries in sample, FT - fiscal transparency, DAS - data assurances, MTBF - medium-term budgeting frameworks, BEX - budget execution reporting, FR - fiscal risks disclosure

<sup>1</sup> A two-sample t-test for differences of means rejects the hypothesis that the means are equal at 10% confidence for each set of means.

<sup>2</sup> Excluding EU Accession countries.

<sup>3</sup> Countries which qualify for the Highly Indebted Poor Countries (HIPC) initiative by World Bank and IMF.

<sup>4</sup> Excluding advanced economies, emerging markets, and EU Accession countries.

Source: Author's calculations.

terms of transparency. As Table 2.4 shows, EU accession countries indeed have higher average transparency index values when compared to the rest of the non-advanced economies and the difference is statistically significant. If the EU accession countries are compared only to other emerging markets, there is little difference between their mean transparency indices.<sup>30</sup> However, a comparison with the advanced economies shows that the EU accession countries are still less transparent on average.

In Latin America, one of the institutional strengths has been the effective use of financial management information systems (FMIS). This has resulted in a higher quality of data on budget execution when compared to their counterparts elsewhere.<sup>31</sup> The better practices are evidenced by a higher mean value for the Budget Execution (BEX) sub-index when compared to other countries, and the difference is statistically significant. At the same time, the difference of means is smaller for the other sub-indices of transparency.

Table 2.4 also compares the average transparency in Highly Indebted Poor Countries (HIPCs) to other poor countries in the sample.<sup>32</sup> The mean of the summary transparency index is not significantly different but the other poor countries perform better in terms of data assurances (DAS) and budget execution data reporting (BEX). One interesting feature is that the sub-index on medium-term budgeting is statistically different and higher for HIPCs. The reason for this is likely that participation

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<sup>30</sup>Results not shown in the table.

<sup>31</sup>See IMF (2003).

<sup>32</sup>Highly Indebted Poor Countries (HIPC) initiative is a program primarily carried out by the IMF and World Bank to provide multilateral debt relief to HIPC countries which can demonstrate an established track record of macroeconomic performance.

in the HIPC initiative requires establishment of public expenditure tracking systems and detailed Poverty Reduction Strategy Papers. This has most likely led to improvements in practices such as statements of medium-term policies, establishment of medium-term economic frameworks, and forward estimates, all of which are captured in the MTBF sub-index.

### 2.5.3 Other Institutional Data

A natural question to ask is how do countries that are more transparent measure in terms of other institutions? If a country is more transparent it is likely that certain political and economic conditions exist which may be conducive to improvements in other institutions.<sup>33</sup> The particular institutions we consider are democracy, trade openness, financial depth, government effectiveness, and voice and accountability.<sup>34</sup>

A more democratic country is likely to be more transparent since the public and civil society may demand more information in a functioning democracy. A competent government in a democracy would also have an incentive to advertise its accomplishment, by publishing information on success of its fiscal policy to improve chances of re-election. However, at the same time, a robust democracy may lead to coalition governments or have more decentralized budgeting processes leading to lower transparency. The democracy measure from the Polity IV database for 2002 is used for

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<sup>33</sup>The relationship of fiscal transparency to political variables is very interesting and needs further exploration. Initial estimates show some promising results, but they are not discussed in this paper in the interest of parsimony.

<sup>34</sup>In addition, corruption, credit ratings, and budget discipline are discussed in detail in the companion paper Hameed (2005).

Table 2.5: Fiscal Transparency and Other Institutional Variables

In column(1) the independent variable is fiscal transparency index (FT). In column(2) log of real GDP per capita (PPP) and geographic dummy variables are included in addition to FT.

Dependent Variables	(1)	Adj.R <sup>2</sup>	(2)	Adj.R <sup>2</sup>
Financial Depth	0.91 (0.36)**	0.17	0.53 (0.44)	0.57
Trade	0.11 (0.24)	-0.01	-0.24 (0.36)	0.82
Openness	0.99 (0.18)***	0.36	0.48 (0.27)*	0.90
Democracy	3.01 (0.37)***	0.58	1.15 (0.65)*	0.59
Government Effectiveness	2.00 (0.56)***	0.19	2.80 (1.03)***	0.15
Accountability				

Robust standard errors in parentheses  
\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%  
Democracy: Democracy measure from Polity IV database  
Financial depth: Domestic credit in percent of GDP  
Trade Openness: Import plus Export in percent of GDP  
Government Effectiveness and Voice and Accountability data from Kaufmann and others (1999 and 2003).

democracy. As can be seen in Table. 2.5, democracy is positively correlated with fiscal transparency and this relationship is significant even after GDP per capita and geographic dummies are included as a control variables.

Countries that are more open to trade or have a higher degree of financial depth are likely to be more transparent. There are two reasons to expect this: first, sustained business relationships with international markets are likely to result in adoption of generally accepted best practices; second, financial depth requires a certain level of transparency through reporting requirements, respect of contracts, and rule of law which may lead to more fiscal transparency. Trade openness is measured as

sum of exports and imports as percentage of GDP and financial depth is proxied by domestic credit as percentage of GDP. The estimation results show that although financial depth is positively related to fiscal transparency with the inclusion of control variables, the relationship is no longer significant. For trade openness, the estimate has the right sign but it is not significant and once the control variables are added the sign switches and is still not significant.

The two other institutional variables considered in this section are government effectiveness and voice and accountability as measured by Kaufmann and others (1999 and 2003). There are important channels through which fiscal transparency can affect these variables, since greater transparency should provide the information needed for the civil society and other actors to press for greater government effectiveness and accountability. However, it is difficult to disentangle the causality in the other direction i.e. countries which perform better on the voice and accountability measures may demand more fiscal transparency. The estimation results in Table. 2.5 show that government effectiveness and voice and accountability measures are positively related to fiscal transparency even after controlling for income and location.

## **2.6 Conclusion**

This paper proposed a summary index and several sub-indices of fiscal transparency based on the published “Fiscal Transparency Reports on Observance of Standards and Codes (ROSCs).” The indices are developed around four different clusters

of practices: data assurance, medium-term budgeting, budget execution reporting, and fiscal risk disclosure. The source data and methodology used to categorize the twenty different aspects of fiscal transparency were discussed. In addition to describing the method used to calculate the index, the paper considers the robustness of the values and ranking to different choices.

The analysis also shows that the fiscal transparency index is correlated with earlier indices of fiscal transparency. A cross-country comparison of fiscal transparency indicates that advanced economies are more transparent, and the emerging markets as a group are also more transparent than other economies. Transparency in EU accession countries, Latin America, and HIPC countries was also analyzed. Finally, this paper briefly discusses how fiscal transparency is related to other institutional variables, and as expected, the institutional variables appear to be correlated with transparency.

The obvious next step for research is to consider how the proposed fiscal transparency indices are related to economic outcomes, as in Hameed (2005). The link between fiscal transparency and other institutional variables deserves further exploration as well. As suggested in Alt and Lassen (2003), political/institutional variables such as political competition or legal origin can affect transparency through some important channels. Another direction for research may be to consider additional information from the Fiscal Transparency ROSCs and see how this affects the summary index. Alternatively, future research could consider the updates to

ROSCs and second-round ROSCs separately to give a time-series dimension to the fiscal transparency indices. This could provide some evidence on effects of changes in transparency and help pin down the direction of causality.

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## 2.7 Appendices

### 2.7.1 Country List

List of ROSCs Included		
Advanced Economies <sup>1</sup>	Others	
Canada	Albania	Malawi
France	Armenia	Mali
Germany	Azerbaijan	Mauritania
Greece	Bangladesh	Mexico
Israel	Benin	Mongolia
Italy	Brazil	Mozambique
Japan	Bulgaria	Nicaragua
Korea	Burkina-Faso	Pakistan
Portugal	Cameroon	Papua New Guinea
Sweden	Chile	Peru
United States	Colombia	Philippines
	Czech Republic	Poland
	Estonia	Romania
	Georgia	Rwanda
	Ghana	Slovak Republic
	Honduras	Slovenia
	Hungary	Sri Lanka
	India	Tanzania
	Iran	Tunisia
	Kazakhstan	Turkey
	Kyrgyz Republic	Uganda
	Latvia	Ukraine
	Lithuania	Uruguay

<sup>1</sup>Based on IMF WEO country classification.

## Chapter 3

# Fiscal Transparency and Economic Outcomes

### 3.1 Introduction

In the past few years, transparency has received considerable attention from both policy makers and researchers. “Lack of transparency” was cited as a partial contributor to financial crises in Asia and Mexico.<sup>1</sup> In a speech in 1999, the Managing Director of the IMF mentioned transparency as the “golden rule” for the new international financial architecture.<sup>2</sup> There was renewed emphasis on acquiring information on

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<sup>1</sup>IMF (2001b) notes that a “lack of transparency was a feature of the buildup to the Mexican crisis of 1994-95 and of the emerging market crises of 1997-98” and that “inadequate economic data, hidden weaknesses in financial systems, and a lack of clarity about government policies and policy formulation contributed to a loss of confidence that ultimately threatened to undermine global stability.”

<sup>2</sup>See IMF Survey, June 7, 1999.

country institutions and the transparency of these institutions. Such precepts helped lead to the development by the IMF and the World Bank of a range of standards of good practices covering various areas of the economy that are now internationally recognized and applied.<sup>3</sup>

This paper uses publicly available IMF staff assessments of the observance of the *Code of Good Practices on Fiscal Transparency* (the fiscal transparency code) to empirically examine several claims regarding the fiscal transparency code. It was argued that the adoption of these practices would, amongst other benefits, bring increased credibility resulting in a lower premium in the financial markets. Kopits and Craig (1998) recognizes that it is difficult to establish a causal link between fiscal transparency and fiscal discipline, but argues that “the better-performing countries . . . generally follow more transparent fiscal practices.” Further, Tanzi (1998) suggests that the *Code of Good Practices on Fiscal Transparency*, “if followed, would have the effect of reducing corruption.” This paper will examine each of these issues in turn by considering whether countries with more transparent fiscal practices have more credibility in the market, better fiscal discipline, and less corruption.

The paper will first present a definition of fiscal transparency, followed by a brief overview of earlier empirical literature on transparency and a discussion on why fiscal transparency matters. The next section will briefly describe the fiscal transparency

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<sup>3</sup>The Executive Boards of the IMF and World Bank have endorsed a list of 12 areas for standards assessments as follows: Data Transparency, Fiscal Transparency, Monetary and Financial Policy Transparency, Banking Supervision, Securities, Insurance, Payments Systems, Corporate Governance, Accounting, Auditing, Insolvency and Creditor Rights, and Anti-Money Laundering and Combating the Financing of Terrorism.

indices.<sup>4</sup> The empirical relationships between fiscal transparency and market credibility, fiscal discipline, and corruption will be discussed in the third section. The paper will conclude with an agenda for future research.

## 3.2 Why fiscal transparency?

Before discussing the relevance of fiscal transparency, it is important to describe what it means. Kopits and Craig (1998) define fiscal transparency as:

Openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities - whether undertaken inside or outside the government sector - so that the electorate and financial markets can accurately assess the government's financial position and the true costs and benefits of government activities, including their present and future economic and social implication.

Focusing on non-transparent practices, Alesina and Perroti (1996) point out overly optimistic macroeconomic and fiscal assumptions; off-budget activities; and shifting of expenditures to future years in multi-year budgets as examples of practices which can reduce transparency. Other non-transparent activities may include not reporting government guarantees, ineffective audit, or delaying release of “bad” news. The *Code of Good Practices on Fiscal Transparency* builds directly on the Kopits and Craig (1998) definition of fiscal transparency (above). The code describes thirty-seven practices under four general principles that represent different dimensions of

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<sup>4</sup>The details of construction of the fiscal transparency index can be found Hameed (2005).

transparency and accountability. The data derived from these observations thus allow a more detailed examination of different aspects of fiscal transparency than is available elsewhere.

The following sections will discuss why fiscal transparency matters for the particular variables of interest, namely credit ratings, fiscal discipline, and corruption. Although many papers have considered the impact of other economic and institutional explanations for these variables, very few have looked at fiscal transparency directly.

### **3.2.1 Transparency and Financial Markets**

Kopits and Craig (1998) suggest that one of the main channels through which transparency may impact economic outcomes is through financial markets. Controlling for economic fundamentals, international financial markets are likely to demand lower premiums from governments that are forthcoming about their fiscal position and risks. The argument is that markets can be more certain about a fiscally transparent government's ability and willingness to service its obligations. Various transparency-related measures have been shown to impact credit ratings, sovereign spreads, foreign direct investment (FDI), and asset allocation.

Glennerster and Shin (2003) find that sovereign spreads decline following the adoption of transparency-related reforms such as publication of IMF country surveil-

lance reports, release of different ROSCs, and compliance to SDDS.<sup>5</sup> IIF (2002) and Christofides and others (2003) show that compliance with SDDS matters for sovereign ratings and spreads. They also consider other measures such as corporate transparency, accounting standards, and corruption, finding that they are important for sovereign ratings and spreads. Gelos and Wei (2002), using various indices of government and corporate transparency, show that emerging market equity funds hold fewer assets in less transparent countries, and herding among funds is somewhat less prevalent in more transparent countries.<sup>6</sup> Drabek and Payne (2001), using a composite government transparency measure, find that high levels of non-transparency can have a detrimental impact on FDI flow.<sup>7</sup>

Although these studies consider measures of transparency broader than fiscal transparency, they show that transparency matters to the markets. This paper argues that more fiscally transparent countries have higher credibility in the markets. Market reaction to fiscal transparency should be reflected in credit ratings, after controlling for certain economic fundamentals. In particular, greater disclosure of fiscal risks and a clear medium-term strategy are likely to reduce uncertainty about the government's fiscal position and lead to improved ratings.

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<sup>5</sup>Special Data Dissemination Standard (SDDS) was established in 1996 to guide countries, that either have or might seek access to international capital markets, in the dissemination of economic and financial data to the public.

<sup>6</sup>Government transparency measure is a combination of the fiscal and monetary policy index produced by Oxford Analytica based mostly on IMF ROSCs for 27 market access countries.

<sup>7</sup>Government transparency measure is based on rankings in the International Risk Guide published by Political Risk Services for level of corruption, law and order, bureaucratic quality, contract viability, and risk of government appropriation of private assets.

### 3.2.2 Transparency and Fiscal Outcomes

In the last decade, institutional explanations of fiscal outcomes have been an active area of research. Several papers have developed indices of “budget institutions” focusing on budget procedures such as: the power of the finance minister vs. other cabinet members; amendment rules; flexibility in budget execution; and budget negotiation among political parties.<sup>8</sup> These studies generally find that “budget institutions” influence fiscal outcomes. Some of these papers, like Von Hagen (1992), consider fiscal transparency separately. But instead of deriving the information from observations of budget systems, the survey respondents were asked directly if the budget was transparent.

Lastly, Alt and Lassen (2003) undertook one of the few studies which focuses directly on fiscal transparency, but it is limited to OECD countries. A career-concern model with political parties is used to derive a testable hypothesis that higher transparency is associated with lower equilibrium debt. A measure of fiscal transparency is constructed based on a self-reported 1999 OECD Questionnaire, and the results show that debt is indeed negatively related to fiscal transparency in OECD countries. Some political drivers of fiscal transparency are also proposed including political competition, common law history, and presidential systems.

This paper will argue that after controlling for certain institutional and economic differences, a more transparent government is likely to be more fiscally disciplined.

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<sup>8</sup>See Von Hagen (1992), Alesina and others (1996), Stein and others (1999), Hallerberg and Von Hagen (1999), and Ylaoutinen (2004).

If the government is forced to produce quality budget execution data and take stock of its fiscal risks, there is a lower probability of a large surprise deficit. The fiscal transparency manual, which elaborates on the code of best practices, suggests that governments move towards a medium-term budgeting framework. If the governments set their budgets in the medium-term and publish their plans in a way that can be monitored, a more disciplined fiscal policy is likely to result.

### **3.2.3 Transparency and Corruption**

Are countries that are more fiscally transparent also less corrupt? Although much broader issues such as rule of law, effectiveness of the judiciary, and civil services reform are critical for reducing corruption, there are some obvious channels through which fiscal transparency can affect corruption. Increased accountability and more effective auditing is likely to reduce opportunities for some forms of corruption. If the government publishes planned budgets and budget execution reports for programs, those outside the government such as intended beneficiaries, civil society, and policy analysts can readily hold the executive accountable.<sup>9</sup> Strengthening internal and external audit functions should reduce misuse/mismanagement of public funds.

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<sup>9</sup>Reinikka and Svensson (2004) cite an example in Uganda where an information campaign by the government, listing the amounts of grants at schools, led to a reduction in slippage after controlling for other demographic and school-specific data. The information provided to the schools and parents allowed them to hold the district officials accountable and to better understand and monitor the grants program.

### 3.3 Fiscal Transparency Indices

This section will start with a brief discussion of the source data and the methodology used for the construction of the fiscal transparency indices. For purposes of analysis, the data are organized into four main clusters: data assurances, medium-term budgeting, budget execution reporting, and fiscal risk disclosure.

#### 3.3.1 Fiscal Transparency ROSCs

The *Code of Good Practices on Fiscal Transparency* was approved by the IMF board in 1998.<sup>10</sup> The code is divided into four sections with thirty-seven elements. The four main sections of the code are: clarity of roles and responsibility; public availability of information; open budget preparation, execution, and reporting; and assurances of integrity.

The IMF and World Bank publish assessment reports for each of the 12 standards and code modules called *Reports on Observance of Standard and Codes*(ROSCs). Participation in preparation of ROSCs is voluntary and the members retain the right to decide on publication. Since the inception of the Fiscal Transparency ROSC program, over 65 ROSCs have been completed with over 60 published.<sup>11</sup> This study excludes the unpublished ROSCs and the initial ROSCs because they were experimental and, in some cases, self-assessments. Many of the earlier ROSCs have been updated several

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<sup>10</sup><http://www.imf.org/external/np/fad/trans/code.htm#code>

<sup>11</sup>All the published reports are available on the IMF ROSC website at <http://www.imf.org/external/np/rosc/rosc.asp?sort=topic#FiscalTransparency>. Since the inception of this paper, several additional ROSCs have been published which will be included in future analysis.

times and are published as separate documents. The information used to construct the indices includes all the updates and published ROSCs.<sup>12</sup> The quality of ROSCs has generally improved over time with increased detail, comprehensiveness, and organization.

Most “good practice” elements of the transparency code have several components and cover a wide range of topics.<sup>13</sup> The reports for each country note the extent of observation of practices in the fiscal transparency code. The ROSCs are textual in nature, and the organization of the report does not strictly follow the code. So, the first step was to divide the report according to elements of the code.<sup>14</sup> Then, the textual information was used to assign numerical categories to selected practices.

### **3.3.2 Construction of Fiscal Transparency Indices**

This paper develops a summary index of fiscal transparency and four sub-indices including data assurances, medium-term budgeting, budget execution reporting, and fiscal risk disclosure.<sup>15</sup> The selection of different aspects of transparency was driven by three main considerations: earlier literature on fiscal transparency, information

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<sup>12</sup>Although this study does not have a time-series dimension to it, the future research agenda includes introducing a time series component considering the updates separately. Further, it is envisaged that on average the countries will be reassessed every 4 years, allowing a richer analysis of changes in practices of fiscal transparency.

<sup>13</sup>For example, element 2.1.3 states that “Statements describing the nature and fiscal significance of central government contingent liabilities and tax expenditures, and of quasi-fiscal activities (QFAs), should be part of the budget documentation.” So this particular element covers a range of topics including contingent liabilities, tax expenditures, and QFAs.

<sup>14</sup>As a matter of routine, the Fiscal Transparency Unit of the IMF’s Fiscal Affairs Department assigns all observations to each element of the code. The practice of including specific code elements is being incorporated in future publications of fiscal ROSCs.

<sup>15</sup>The rest of this section is similar to discussion in Hameed (2005).

content/classification, and tractability.<sup>16</sup> The practices included in each cluster of fiscal transparency can be seen in Table 3.1.<sup>17</sup>

Even if a government publishes significant fiscal information, it is still possible for it to be considered non-transparent because of low quality data or unclear presentation. Therefore, the first sub-index looks at “data assurances” (DAS), i.e., practices which improve the reliability and credibility of fiscal data.<sup>18</sup> Good practices in this area would, for example, prevent presentation of an inaccurate picture of the budget through the use of overly optimistic macro-economic and fiscal forecasts. This problem is addressed in the *Code of Good Practice on Fiscal Transparency* by, for instance, suggesting that the governments invite independent experts to assess macroeconomic projections, fiscal projections, and the underlying assumptions. In other cases, using off-budget activity, varying the definition of government, and reclassifying revenue can hide the true extent of the deficit. So, transparency can be improved by adhering to a uniform classification of data (within government and across different levels of government) and using a widely accepted definition of government. These practices make it easier for those outside the government such as civil society, investors, and policy analysts to understand and analyze the budget.

The next cluster considered is the medium-term budgeting framework (MTBF).<sup>19</sup>

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<sup>16</sup>For earlier literature on fiscal transparency see Allan and Parry (2003), Alt and Lassen (2003), and IMF (2003a). For more details on selection of aspects see Hameed (2005).

<sup>17</sup>The second column in the table shows the correspondence between the practice considered and the relevant code from the *Code of Good Practices on Fiscal Transparency*.

<sup>18</sup>The accounting related reliability measures are discussed below under budget execution reporting.

<sup>19</sup>See Allan and Parry (2003) and the *Manual on Fiscal Transparency* for description of an MTBF.

Table 3.1: Fiscal Transparency Clusters

Cluster	Code <sup>1</sup>	Practices of Transparency <sup>2</sup>
<b>Data</b>	3.2.1	Budget Classification
<b>Assurance</b>	2.2.1, 2.2.2	Release of Data
	2.1.1, 3.2.1	Budget Coverage
	4.2.2	Independent Assessment of Forecasts
	4.1.1	Budget Realism
<b>Medium-term</b>	3.1.1	Policy Objectives
<b>Budgeting</b>	2.1.2	Forward Estimates
	3.1.3	Projections guided by a Medium-term Economic Framework
	3.1.4	New Policy Costs
	3.1.5	Fiscal/Macro Risks
	3.3.1	Accounting System
<b>Budget</b>	3.3.1	Accounting System
<b>Execution</b>	4.2.1	External Audit
	3.4.2	Final Accounts
	3.3.3	Internal Audit
	3.4.1	Mid-Year Reporting
<b>Fiscal</b>	2.1.3	Contingent Liabilities
	2.1.4	Debt
	2.1.3, 1.1.4	Quasi-Fiscal Activity - Financial
	2.1.3, 1.1.4	Quasi-Fiscal Activity - NFPE <sup>3</sup>
	2.1.3	Tax Expenditures

<sup>1</sup>The elements of the *Code of Good Practices on Fiscal Transparency* are labeled 1.1.1 to 4.2.3. These are the primary elements considered during classification, although in certain cases information from other parts of the ROSC was also used.

<sup>2</sup> See Appendix III for description of the different practices.

<sup>3</sup>NFPE-Non- Financial Public Enterprises.

The particular practices included in this sub-index can be seen in Table 3.1. Government budgets are usually formulated on an annual cycle. But to be meaningful and effective, the budgets must take into account factors outside the budget cycle, such as long term investment plans, revenue trends, multi-year program costs, or macroeconomic realities. MTBF is a tool for better assessing, formulating, and implementing fiscal policy in the medium-term. Although an effective implementation of an MTBF requires a certain level of institutional sophistication, many governments with lower institutional capacity have adopted a phased approach to establishment of MTBFs by taking steps such as improving forecasting, formulating budget objectives, and costing new programs.

The proposed MTBF index attempts to capture the progress of this phased approach. A medium-term focus on the budget can enhance fiscal transparency through many channels. For example, the practice of distinguishing between the costs of continuing policies and new policies can improve transparency by making it easier to assess the factors contributing to deviations between planned and actual expenditures. It also becomes easier to establish a more direct link between the government's objectives and its budget proposal. Finally, considering the new policy costs separately may induce more disciplined medium-term budgets. A commitment to publishing forward estimates and explaining any drastic changes to projections is a major step toward policy accountability, and its adoption, is likely to lead to disciplined budgeting.

Disciplined budget execution is a crucial requirement for transparency and prob-

lems at the budget execution (BEX) stage can make any budget useless. An effective accounting system is a crucial part of budget execution. In addition, the index incorporates issues such as effectiveness of internal audits and external audits. In order to monitor the implementation stage, practices on mid-year reporting and publication of final accounts are also included.

Finally, a measure of disclosure of fiscal risk (FR) is also considered. There are several sources of fiscal risk that can affect a government's fiscal position either by increasing its obligations or reducing its resources. Requiring the government to publish information on possible sources of risk would present a more accurate picture of the fiscal position, improve credibility of the government by reducing uncertainty regarding its fiscal position, and may also prod the government to reduce sources of risk. The sources of fiscal risk considered include contingent liabilities, debt, and quasi-fiscal activity.<sup>20</sup>

Table 3.1 lays out the practices included in each of the sub-indices of transparency. Each practice was assigned a category 0, 0.33, 0.66, or 1, where 0 indicates weak practices, and a 1 indicates strong practices.<sup>21</sup> In some cases, no information was reported for certain practices, so these were noted as missing. For those practices that ask about publication of information, like contingent liabilities, the classification also takes into account the fact that some information may not be published because

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<sup>20</sup>Quasi-fiscal activities (QFAs), such as directed lending or subsidized loans in the current period, may lead to losses/recapitalization in future.

<sup>21</sup>Appendix III defines each of the practices in more detail. The specific tables used to classify each practice can be found in Hameed (2005). Although the classification involves judgment, the results should be close if others follow the same methodology.

it is not relevant for the country. For example, a country that has limited contingent liabilities should not be classified lower even if it does not publish information on them. The summary index of fiscal transparency is calculated as a mean of all the practices listed in Table 3.1, and the sub-indices are calculated as means of their respective components.<sup>22</sup>

### 3.4 Empirical Relationships

The strategy in this section is to first identify a parsimonious model for each of the variables of interest (credit ratings, fiscal balance, and control of corruption) based on existing literature. Transparency indices are then added to the model to test if transparency is related to the variable of interest after accounting for the selected control variables.

The empirical section is limited to cross-section analysis because the fiscal transparency index has no time variation. Many countries in the sample, such as EU accession countries, have gone through significant changes in the last decade. Therefore, any panel analysis would have to be limited to the last few years, thus precluding any meaningful analysis. As mentioned earlier, the future research agenda includes introducing a time series component considering the updates separately. If countries are reassessed every 4 years as planned, a much richer analysis of changes in practices

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<sup>22</sup>For robustness, the summary index was also calculated using random weights instead of equal weights. Although the analysis is not shown here, the index and ranking of countries are robust to these changes with slight variations. See a companion paper Hameed (2005).

of fiscal transparency would also become feasible.

Another important theoretical consideration is the issue of endogeneity of fiscal transparency. Institutions drive economic conditions, but at the same time economic conditions can influence institutions. For example, a financial crisis may provide impetus for a country to implement significant institutional reform. In the existing institutional literature, the primary strategy for dealing with endogeneity is to use instrumental variables. But the theoretical and empirical work on fiscal transparency is still in its infancy, so a thorough discussion of instruments for transparency is proposed as a direction for future research.<sup>23</sup> Endogeneity makes it difficult to claim causality between fiscal transparency and performance variables, but it is still useful to show correspondence between them.

Since the data are based on a cross-section of countries, all the regressions were tested for heterogeneity using the Breusch and Pagan test. In cases where there was evidence of heterogeneity, White standard errors are reported.<sup>24</sup> Most of the models in this section, as in earlier studies, display multicollinearity, i.e., correlation between the control variables. So, for example, in the corruption model both income and education variables are included, and both are highly correlated. Theoretically, even with multicollinearity, OLS estimates are unbiased; but the variance of the estimated coefficients is higher.<sup>25</sup> This means that it becomes more difficult to reject the null hy-

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<sup>23</sup>Alt and Lassen (2003) suggest using political variables such as political competition, presidential system, and common law basis as instruments for transparency.

<sup>24</sup>These are heteroskedasticity-robust standard errors as described in Wooldridge (2001), pp. 55-58.

<sup>25</sup>See Wooldridge (2003), p. 97.

pothesis that the coefficients are zero, but otherwise the problem of multicollinearity can be ignored.

Experience suggests that results in empirical institutional work may be sensitive to country sample selection and choice of components included in the index. To check for the robustness of results to sample selection, each model is re-estimated with a randomly selected 90 percent sub-sample. Each iteration notes if the coefficient on the transparency index is significant at 10 percent. The statistic of interest is the ratio of the number of times the coefficient is significant over all the iterations. A high (low) number indicates that the significance (or non-significance) is robust to sample selection. Although the results are not reported, the sign of the coefficient is robust to sample selection, and in most cases statistical significance is also robust to sample selection. Similarly, the results were found to be mostly robust to inclusion of different practices. Specifically, each model was re-estimated with a fiscal transparency index calculated excluding one or two randomly selected practices. In most cases, the coefficient on the fiscal transparency index remained positive and significant.

### **3.4.1 Credit Ratings**

The last decade has seen an unprecedented increase in international financial flows with a large number of countries accessing international credit markets. The number of countries with sovereign credit ratings has risen from 30 in 1980 to over a hundred

in 2005.<sup>26</sup> Sovereign credit ratings assess a government's ability and willingness to honor its debt.<sup>27</sup> Countries which are more transparent are more likely to convince the markets about their ability and willingness to honor their debt. This should be reflected in better credit rating, so a logical question to ask is whether more transparent countries have better ratings after controlling for other economic fundamentals.

Significant literature exists analyzing the determinants of risk proxied by credit ratings. Cantor and Packer (1996) find that rating assignments by Moody's and Standard and Poor's are related to a limited set of economic fundamentals including per capita income, growth, fiscal balance, external balance, external debt, economic development, and default history. Mulder and Perreli (2001) find that the ratio of debt to exports, rescheduling history, and ratio of investment to GDP have a significant impact on changes in ratings. Earlier papers on market effects of transparency have also considered sovereign spreads as a measure of risk.<sup>28</sup> This section focuses on credit ratings because, first, composite sovereign spreads are available for a limited number of countries with fiscal transparency ROSCs, and second, previous literature has shown that credit ratings are strongly related to sovereign spread changes.<sup>29</sup>

The credit ratings variable is an average of the Moody's, Standard and Poor's, and Fitch sovereign rating on foreign currency long-term debt for countries which have

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<sup>26</sup>Primarily Moody's, Fitch, and Standard and Poor's.

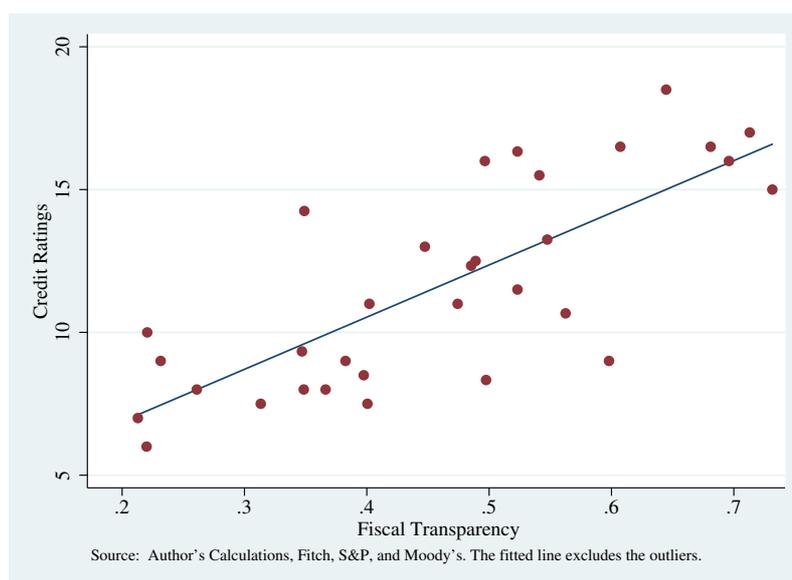
<sup>27</sup>See Standards and Poor's (2002).

<sup>28</sup>See Christofides and others (2003) and Glennerster and Shin (2003).

<sup>29</sup>Ratings were shown to Granger cause changes in sovereign spreads by Reisen and Maltzan (1999). Kaminsky and Schmukler (1999) find that credit rating changes have a significant impact on sovereign spreads.

published fiscal ROSCs. Excluding the advanced economies, there are 31 countries which had published fiscal ROSCs and had sovereign credit ratings. The credit ratings observations were made mid-June of 2004.<sup>30</sup> The alphabetical ratings were converted into numerical ratings using a simple alphabetical ranking with D (Default) = 1 and AAA (Aaa for Moody's) = 22. So a higher credit rating number indicates a better rating, i.e., lower risk of default.

Figure 3.1: Fiscal Transparency and Sovereign Rating



The advanced economies generally have high ratings, regardless of their transparency practices mostly due to the market perception of their creditworthiness. This section focuses on emerging market countries and developing economies because they have a more realistic risk of sovereign default, and therefore are most likely to see an impact of more reliable information on current fiscal conditions and certainty about

<sup>30</sup>The results are robust to observations at a different time and also averages over time.

ability to pay. Figure 3.1 shows a positive relationship between credit ratings and fiscal transparency.<sup>31</sup>

The core model for credit ratings includes current GDP per capita, growth, inflation, external debt, indicator for default history, external balance, and fiscal balance.<sup>32</sup> Except for the default history indicator, a five-year average (1998-2002) of each variable is used. The income variable and growth variable are included to capture the potential tax base and the ability of the government to repay its debt. Problems with inflation can indicate structural problems in government finances, inflationary money supply, or general instability of the economy. The obvious reason for including external debt is that a greater debt burden increases the probability of default. The actual variable used is the external debt in percentage of exports. The default history variable indicates if a country has defaulted in the last 5 years. Primary fiscal balance and external balance (in percent of GDP) are included because they are important indicators of the government's available resources and financial sustainability.

Table 3.2 shows the estimation results for various regressions of credit ratings over fiscal transparency. Column(1) includes only fiscal transparency and shows that there is a statistically significant and positive relationship between ratings and transparency with no controls. In order to reduce some omitted variable bias, a core model of credit

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<sup>31</sup>One obvious outlier was Brazil with very low ratings but high fiscal transparency. In the last few years, Brazil has made a concerted effort to adopt more transparent practices, particularly with the adoption and successful implementation of the Budget Responsibility Law. Brazil's credit rating, on the other hand, is most likely affected by the recent financial troubles in neighboring countries, therefore, Brazil was excluded from analysis.

<sup>32</sup>See Appendix II for data sources and description.

Table 3.2: Fiscal Transparency and Sovereign Ratings

(Cross-section regressions, average 1998-2002)

	(1)	(2)	(3)	(4)	(5)	(6)
FT	18.27 (2.79)***	7.66 (2.44)***				
DAS			3.07 (1.97)			
MTBF				2.86 (1.29)**		
BEX					1.95 (1.83)	
FR						6.34 (2.36)**
Obs.	32	31	31	31	31	30
Adj. R <sup>2</sup>	0.58	0.83	0.77	0.80	0.76	0.81

Standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

The dependent variable in each column is sovereign rating.

FT - fiscal transparency, DAS - data assurances, MTBF - medium-term budgeting frameworks, BEX - budget execution reporting, FR - fiscal risks disclosure.

Column(1) includes only the fiscal transparency index.

Column(2)-Column(6) include a core model in addition to the reported estimates where the core model includes GDP per capita in dollars, inflation, a default index, growth, external debt in percent of exports, fiscal balance and external balance in percent of GDP. (The sources for data are described in Appendix II.)

rating is included in addition to the transparency variable. The core model alone explains about 76 percent of the variation in credit ratings.<sup>33</sup> Most variables included in the model have the expected signs but many of them are not statistically significant. As mentioned earlier, this is most likely due to the presence of multicollinearity and limited degrees of freedom. This observation is similar to that of Cantor and Packer (1996), who find that although certain estimates had the right sign, they are not statistically significant. But the variables are still included in estimation, since there are appealing theoretical arguments for why they belong in the model.

The summary fiscal transparency is added in column(2) of Table 3.2, which has a positive and highly significant coefficient. Adding fiscal transparency to the core model explains an additional 7 percent of the variation, with the adjusted R<sup>2</sup> rising from 0.76 to 0.83. Although the results of the core model are suppressed in the interest of clearer presentation, the significant coefficients have the expected signs and are similar in size and significance to the estimates without any transparency indices (see footnote <sup>33</sup>). It is difficult to give a quantitative interpretation to the value of the transparency coefficient, but it is useful to consider the change in predicted rating with a change in transparency. For example, if countries in the lowest fifth quartile of transparency rise to the average transparency index for the highest fifth

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<sup>33</sup>The estimated core model without any transparency index is shown below. The dependent variable is the average credit rating, and the second row shows the standard errors (See Appendix II for details of variables).

CONS	GDPPC	INF	DEFIND	GROWTH	XDEBT	CA	PRIBAL
10.00	1.00	-4.93	-1.86	27.89	-0.63	-2.70	10.45
(1.59)***	(0.25)***	(3.11)	(0.93)*	(19.73)	(0.34)*	(8.92)	(12.59)

quartile in sample (0.68), the average rating changes from 8.1 to 11.6. This is an increase of 3.5 notches with a change in fiscal transparency index from 0.26 to 0.68. If they further improve transparency to 1 the predicted credit rating increases to 14.1, which is investment grade. Each of the sub-indices are added individually in column(3)-column(7).<sup>34</sup> The coefficients are positive in all the cases but are significant for only the medium-term budgeting frameworks (MTBF) and fiscal risk disclosure (FR) indices.

This section considered the relationship of market credibility, proxied by credit rating, and fiscal transparency. The results show that fiscal transparency matters for credit ratings. Specifically, after controlling for several economic fundamentals the results show that credit ratings are positively related to the summary transparency index (FT), medium-term budgeting frameworks index (MTBF), and fiscal risk disclosures index (FR).

### 3.4.2 Fiscal Discipline

In the last decade, many papers have appeared on relationships between political economy variables and fiscal policy outcomes, motivated by the observation that many outcomes could not be explained solely based on macroeconomic variables.<sup>35</sup>

The variables considered have included electoral rules, constitutions, finance minister

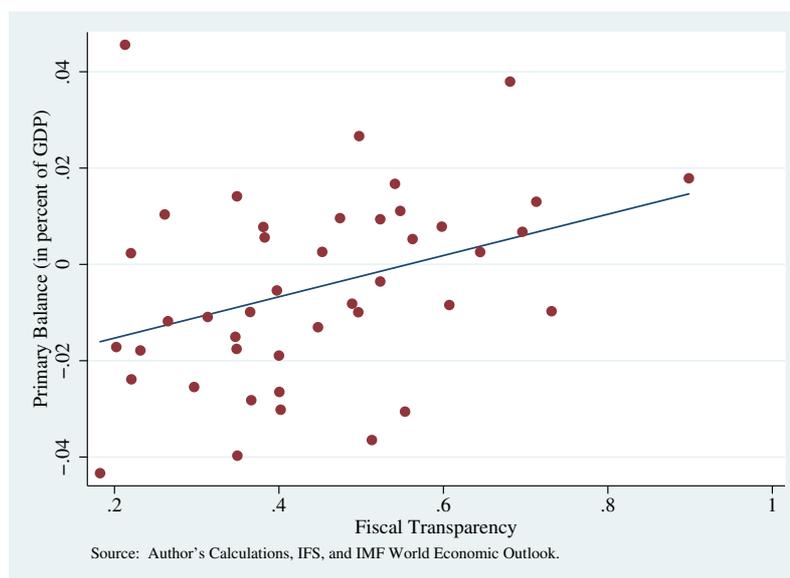
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<sup>34</sup>A model including all the sub-indices and the core model was estimated but because of limited degrees of freedom and high correlation amongst the sub-indices, none of the coefficients on sub-indices were significant even though they were the right sign.

<sup>35</sup>See Persson and Tabellini (2001), Persson (2002), and Alesina and others (1996).

turnover, and political stability. This section of the paper continues in a similar vein by asserting that fiscal policy outcomes are related to fiscal transparency. In particular, this section asks the question if more transparent countries display more fiscal discipline. A medium-term outlook of budget and careful stock taking of fiscal risks are likely to result in disciplined budgets. Moreover, strengthened budget execution reporting should also result in disciplined implementation of the budget.

Figure 3.2: Fiscal Transparency and Primary Balances



Fiscal discipline is proxied by the average primary balance over the last 5 years. Primary balance is a preferred measure of the government's fiscal stance because it abstracts from the effect of inflation on interest payments, and the fact that interest payments are a function of accumulated debt and not present fiscal stance. Again, the fiscal balances in more advanced economies are most likely driven by different dynamics than in non-industrial countries so the analysis here focuses on non-industrial

countries.<sup>36</sup> <sup>37</sup> Figure 3.2 shows the average primary balances compared to fiscal transparency. Primary balances are higher for more transparent countries, though the data is highly dispersed suggesting the relationship may not be robust.

Simple bivariate regressions (shown in Table 3.3) tell a similar story. There is a positive and statistically significant relationship between primary balances and fiscal transparency (FT), DAS, MTBF, and FR. Contrary to expectations the coefficients on BEX, although positive, is not significant. The next section considers the relationships with some additional controls.

Another way of looking at the average data is by quartiles of fiscal transparency. If a positive relationship exists between fiscal transparency and fiscal discipline then countries in the higher quartile should have higher balances. Table 3.4 shows the average primary balance (Column(3)) over three quartiles of fiscal transparency. Although the average balances worsen for lower transparency quartiles, a t-test for the difference in means between the highest and lowest quartiles is not statistically strong with the probability near the 10 percent threshold. One possible reason for this may be the inclusion of Highly Indebted Poor Countries (HIPC) in the sample, which have better MTBF indices than other poor countries resulting in higher fiscal transparency (FT) index, but at the same time their experience on fiscal balances has been varied.

<sup>38</sup> In order to control for difference due to being a HIPC, Table 3.4 considers fiscal

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<sup>36</sup>See IMF (2003c) for the differences in fiscal policy reaction function.

<sup>37</sup>To reduce the impact of outliers, the analysis is limited to countries with primary balances within two standard deviations of the overall mean primary balance. As a result, Bulgaria, Mauritania, and Mongolia were dropped.

<sup>38</sup>Highly Indebted Poor Countries (HIPC) initiative, is a program primarily carried out by the

Table 3.3: Fiscal Transparency and Primary Balances (Bivariate)

	(Bivariate Regression Results)				
	(1)	(2)	(3)	(4)	(5)
FT	0.04 (0.02)**				
DAS		0.03 (0.01)**			
MTBF			0.03 (0.01)**		
BEX				0.01 (0.01)	
FR					0.04 (0.01)***
Obs.	43	43	43	43	42
Adj. R <sup>2</sup>	0.10	0.09	0.08	-0.01	0.16

Standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

FT - fiscal transparency, DAS - data assurances, MTBF - medium-term budgeting frameworks, BEX - budget execution reporting, FR - fiscal risks disclosure

Dependent variable is average primary balance in percent of GDP from 1998 - 2002.

Table 3.4: Average Primary Balances

(by Fiscal Transparency Quartiles)						
		All			No HIPC	
Transparency	N	FT	PB	N	FT	PB
High	15	0.62	0.27	11	0.66	0.49
Mid	14	0.43	-0.70	10	0.49	-0.39
Low	14	0.27	-1.07	10	0.30	-0.83
Total	43			31		

N = number of countries in the relevant quartile  
 FT = average fiscal transparency for the quartile group  
 PB = average primary balance for the quartile group from 1998-2002  
 Source: Author's calculations.

transparency quartiles excluding HIPCs. In column(6), null hypothesis of differences between the top quartile and the lowest quartile can be rejected at 10 percent significance. Since the dynamics of primary balances and fiscal transparency are most likely affected by the HIPC process, the analysis with control variables excludes all HIPCs.

Certain economic/socio-economic variables are included in the analysis to control for variables which are likely to shape fiscal balances. The control variables, based on earlier literature, include a measure of development proxied by log of real GDP, openness measured as exports plus import over GDP, population size as log of population, IMF and World Bank to provide multilateral debt relief to HIPC countries which can demonstrate an established track record of macroeconomic performance. A cross-country comparison of the HIPC countries and other poor countries shows that the sub-index on medium-term budgeting (MTBF) is statistically different and higher for HIPC countries. The reason for this is likely that participation in the HIPC initiative requires establishment of public expenditure tracking systems and detailed poverty reduction strategy papers. This has led to improvements in practices such as statements of medium-term policies, establishment of medium-term economic frameworks, and forward estimates, practices that are captured in MTBF sub-index.

percentage of population over 65 years old, and working age population measured as percentage of population between 15 and 65 years of age.<sup>39</sup> <sup>40</sup> The working age population ratio is included to capture the ratio of active tax paying population relative to dependents. Finally, initial debt, proxied by external debt<sup>41</sup> in the year prior to beginning of the sample (1997), is also included since highly indebted countries need to run higher primary surpluses as a result of larger debt servicing obligations.

Table 3.5 shows the estimates for the transparency indices including all the control variables. The core model without any transparency related variables has an adjusted R<sup>2</sup> of 0.26, but once the transparency variables are added, the adjusted R<sup>2</sup> increases up to 0.49 for MTBF.<sup>42</sup> The FT index in column(1) is positive and significant, implying that the more transparent countries are likely to have higher fiscal balances. If the lowest fifth quartile by transparency (0.26) improves transparency up to the highest fifth quartile (0.73), the average primary balance changes from -1.2 percent of GDP to 1.0 percent of GDP. Similarly, if the highest fifth quartile (0.73) is able to improve its transparency to 1 the predicted primary balance changes from 1.0 to 2.2 percent of GDP. Both MTBF and FR sub-indices appear to be driving the result with significant

<sup>39</sup>See Alesina and others (1996), and Persson and Tabellini (2001) and (2004).

<sup>40</sup>The sources and description of data are included in the Appendix II. A second set of controls including geographic dummies and legal origin dummies are also included in the literature, but this would have severely reduced the degrees of freedom and thus were not included.

<sup>41</sup>The total public debt would be a more appropriate measure, but it is available for a limited number of countries. So, based on earlier studies, it is proxied by external debt.

<sup>42</sup>The estimated core model without any transparency index is shown below. The dependent variable is the primary fiscal balance and the second row shows the standard errors. Although the variables have the right signs, they are not significant.

CON	WORKPOP	OV65	POP	OPEN	LPPP	XDEBT
-0.051	-0.246	0.252	0.006	0.007	0.009	0.041
(0.089)	(0.130)*	(0.127)*	(0.002)**	(0.012)	(0.006)	(0.024)*

Table 3.5: Fiscal Transparency and Primary Balances

	(cross-section regressions with controls)				
	(1)	(2)	(3)	(4)	(5)
FT	0.05 (0.02)**				
DAS		0.03 (0.02)			
MTBF			0.04 (0.01)***		
BEX				0.00 (0.02)	
FR					0.03 (0.02)*
Obs.	30	30	30	30	30
Adj. R <sup>2</sup>	0.36	0.28	0.49	0.22	0.34

Standard errors in parentheses

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

The dependent variable in each column is the five year average of fiscal balance in percent of GDP. The analysis excludes Advanced Economies and HIPC countries.

FT - fiscal transparency, DAS - data assurances, MTBF - medium-term budgeting frameworks, BEX - budget execution, and FR - fiscal risks

Each column includes a core model in addition to the reported estimates. The core model include log of real GDP per capita (PPP), trade openness, population size, percentage of population over 65 and between 15 and 65 years of age, and external debt in percent of GDP in 1997.

estimated coefficients. After including control variables, both DAS and BEX are no longer statistically significant though they still have the right sign.

It is important to point out that the relationship between transparency and fiscal discipline is likely to be stronger than suggested by these results. Countries which are less transparent are likely to be over reporting their primary balances which would negatively bias the relationship between primary balance and transparency.<sup>43</sup> It is difficult to construct measures of the true deficits for less transparent countries because being less transparent means there is less information available.

This section considered the relationship between fiscal transparency indices and fiscal discipline. One clear result is that countries with higher MTBF indices, implying a more systematic medium-term outlook on budget, tend to have higher fiscal discipline after controlling for various economic/demographic variables. In addition, the summary transparency (FT) index and the fiscal risk (FR) measure are also significant. Surprisingly, the budget execution (BEX) shows no association with fiscal discipline.

### **3.4.3 Corruption**

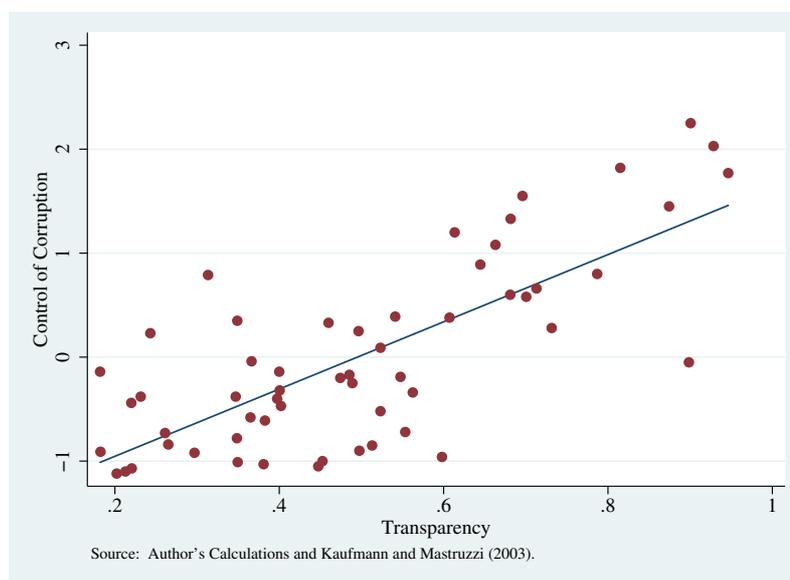
As noted in the introduction, several channels of corruption can be dampened by greater fiscal transparency, including increased accountability, less tax discretion, and more effective auditing. This section considers whether more transparent countries

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<sup>43</sup>They are also more likely to have higher off-budget activity.

have lower corruption. Corruption is proxied by the “control of corruption” index by Kaufmann and Mastruzzi (2003), so a higher number implies less corruption.<sup>44</sup> The index is based on a composite of several widely available sources on perception of corruption and attempts to measure the control over use of public power for private gain. Figure 3.3 below shows that transparency is positively correlated with control of corruption. The most transparent countries such as Canada, USA, and Germany also have the greatest control over corruption. But then, these countries are also the wealthiest economies suggesting that some control variables need to be included in the estimation.

Figure 3.3: Fiscal Transparency and Corruption



<sup>44</sup>Although not shown, the results discussed below are robust to use of Transparency International (TI) (2004) corruption perception index (CPI) instead. Further, correlation between TI measure and “control of corruption” is 0.96. The results for the “control of corruption” index are presented because it is available for a larger group of countries. The analysis uses the observation in 2002, but the results are also robust to using an average over all available years.

Several economic, social, historical and geographical variable have been considered in earlier empirical studies of corruption.<sup>45</sup> Measures of economic development, trade openness, fractionalization of the population, democracy, education, geographic location and legal origin were included as control variables. Economic development, proxied with log real GDP per capita and trade openness, defined as the sum of exports and imports as percentage of GDP, were included because earlier studies have shown that they are related to less corruption. Several studies have also found that fractionalization of the population is positively correlated with corruption.<sup>46</sup> So an average of religious, ethnic, and linguistic fractionalization, calculated by Alesina and others (2003), is used as a measure of fractionalization. Level of democracy is proxied by the Polity IV democracy index. Education proxied by gross secondary school enrollment is used to control for the effect that a more educated population may be less likely to stand for government corruption. Following earlier literature, dummy variables for continent location and legal origins are also included.<sup>47</sup>

Table 3.6 shows the coefficient estimates for the different transparency indices. Column(1) re-emphasizes the conclusion from Figure 3.3, i.e., higher fiscal transparency is associated with greater “control of corruption” with a significant and positive coefficient. Once other control variables are added in column(2)-column(6), the coefficients are smaller but still significant, with an adjusted-R<sup>2</sup> of 0.78.<sup>48</sup> The co-

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<sup>45</sup>See Lambsdorff (1999) for a review. Also Abed and Gupta (2002) and Persson and others (2000).

<sup>46</sup>See Mauro (1995) and La Porta and others (1999).

<sup>47</sup>See La Porta and others (1998).

<sup>48</sup>The coefficient estimates for the complete core model were suppressed in the interest of clarity of presentation. Most variables had the right sign but very few were significant, most likely because

Table 3.6: Fiscal Transparency and Control of Corruption

(Dependent variable is control of corruption)

	(1)	(2)	(3)	(4)	(5)	(6)
FT	3.23 (0.38)***	0.97 (0.54)*				
DAS			0.23 (0.42)			
MTBF				0.61 (0.32)*		
BEX					0.37 (0.43)	
FR						0.57 (0.40)
Obs.	57	57	57	57	56	56
Adj. R <sup>2</sup>	0.55	0.78	0.77	0.78	0.77	0.78

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

Column(1) includes no controls

Column(2)-column(6) in addition to the transparency index include a core model with log real GDP, dummy for advanced economies, dummies for geographical location, dummies for legal origin, trade openness, fractionalization, , and education (The sources for each variable are discusses in the text.)

efficient for the summary transparency index (FT) is positive and significant at 10 percent confidence level. If countries in the lowest 10th percentile of transparency (0.20) improve their transparency up to the highest 10th percentile average (0.91), they would see a change in control of corruption index from -0.8 to -0.12. This is nowhere close to the control of corruption index value in the most transparent countries, which have an average index value of 1.49. This indicates that although transparency and corruption are related, much of the corruption is explained by other variables. All the coefficients for sub-indices of transparency are positive, but only the medium-term budgeting framework (MTBF) index is significant.

This section considered the incidence of corruption and fiscal transparency. After controlling certain geographical, economic, and demographic factors, the results show that countries that are more transparent also have better control over corruption. All the sub-indices were positively related to control of corruption but only the medium-term budget framework (MTBF) sub-index was statistically significant.

### 3.5 Conclusion

This paper describes a new index of fiscal transparency based on reports of adherence to the *Code of Good Practices on Fiscal Transparency*. The relationship of collinearity. More control of corruption is associated with higher development, being an advanced economy, higher education, and more democratic regimes. Higher fractionalization, higher openness, and bigger populations are associated with lower “control of corruption”. Countries with legal origins in English or Scandinavian law seem to have relatively more control over corruption than others. These results are in-line with findings in earlier papers, except for openness which was earlier associated positively to “control of corruption”.

of fiscal transparency to market credibility, fiscal discipline, and corruption is also examined. Fiscal transparency is associated with higher credit ratings even after controlling for various economic fundamentals. Although all the sub-indices considered had positive coefficients, they were only significant for fiscal risk disclosure (FR) and medium-term budgeting frameworks (MTBF). Countries with better practices in fiscal transparency also display more fiscal discipline even after controlling for certain socio-economic variables. The significant sub-indices were medium-term budget frameworks (MTBF) and fiscal risk disclosure (FR). Similarly, control of corruption was also shown to be coincidental to fiscal transparency, and this result is robust to inclusion of several control variables. Only the medium-term budgeting frameworks (MTBF) index was significant when the sub-indices were considered individually.

A fruitful direction for future research would be to consider the determinants of fiscal transparency. One of the limitations of this study was the difficulty in establishing causality due to lack of appropriate instrumental variables. Alt and Lassen (2003) suggest political competition as an instrument for fiscal transparency, based on the observation that political parties prefer more transparency if there is a high probability that they might lose office in the next term. Other factors that may affect fiscal transparency could include level of democracy, existence of coalition governments, colonial history, and legal origins. Another proposed direction of future research is to consider the updates to ROSCs and second-round ROSCs separately to give a time-series dimension to the fiscal transparency index. This could provide

some evidence on effects of changes in transparency and help pin down the direction of causality.

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## 3.6 Appendices

### 3.6.1 Appendix I: Country List

List of ROSCs Included		
Advanced Economies <sup>1</sup>	Others	
Canada	Albania	Malawi
France	Armenia	Mali
Germany	Azerbaijan	Mauritania
Greece	Bangladesh	Mexico
Israel	Benin	Mongolia
Italy	Brazil	Mozambique
Japan	Bulgaria	Nicaragua
Korea	Burkina-Faso	Pakistan
Portugal	Cameroon	Papua New Guinea
Sweden	Chile	Peru
United States	Colombia	Philippines
	Czech Republic	Poland
	Estonia	Romania
	Georgia	Rwanda
	Ghana	Slovak Republic
	Honduras	Slovenia
	Hungary	Sri Lanka
	India	Tanzania
	Iran	Tunisia
	Kazakhstan	Turkey
	Kyrgyz Republic	Uganda
	Latvia	Ukraine
	Lithuania	Uruguay

<sup>1</sup>Based on IMF WEO country classification.

### 3.6.2 Appendix II: Data Sources

- Advanced Economies - dummy variable which equals 1 if the IMF classifies the country as an advanced economy in its World Economic Outlook.
- BUDDOC - Index on availability of executive budget documents from International Budget Project, IBP (2004)
- External Balance (CA)- current account balance in percent of GDP from the International Financial Statistics (IFS) published by the IMF. In some cases the data was supplemented with World Economic Outlook database from the IMF.
- Control of Corruption - the control of corruption index from Kaufmann and Mastruzzi (2003) at the World Bank. Regularly updated and available online. See Kaufmann and others (1999) for development of the index.
- Credit Ratings (CR) - the alphabetical ratings from Fitch, Moody's and Standard and Poor's were converted to numeric ratings using a simple alphabetical ordering of the actual ratings. D (Default) = 1 and AAA (Aaa for Moody's) = 22. For countries which were rated by more than one agency, the average rating was used.
- Default History Indicator (DEFIND)- Equals 1 if country is reported to be in default for any one year during the sample period by Standard and Poor's;

otherwise zero. See Standard and Poor's (2004).

- Democracy (DEMOC) - based on the democracy measure in the Polity IV dataset.
- Fractionalization (ELRF) - measured by an average of ethnic, linguistic, and religious fractionalization as presented in Alesina and others (2003).
- GDP per capita (GDPPC) - from the World Development Indicators database published by the World Bank
- Geographic Location - dummy variables for the different continents based on location.
- Growth (GR)- annual change in real GDP per capita from the International Financial Statistics database published by the IMF.
- Inflation (INF) - annual change in CPI from the International Financial Statistics (IFS) database published by the IMF.
- Legal Origin - dummy variables for four main sources of legal origin: English, French, Scandinavian/German, and Socialist. Based on La Porta and others (1999). Supplemented with information from [www.nationalmaster.com](http://www.nationalmaster.com)
- Log of real GDP per capita (LPPP) - Log of real GDP adjusted for purchasing price parity as reported in the World Development Indicators, published by the World Bank.

- MONEVL - Index on availability of monitoring and evaluation reports from International Budget Project, IBP (2004)
- Trade Openness (OPEN) - calculated as the sum of exports and imports in percent of GDP. From the International Financial Statistics published by the IMF.
- Percentage of Population over 65 (OV65) - from the World Development Indicators by the World Bank.
- Oxford Analytica Fiscal Transparency - Fiscal policy transparency index reported by Oxford Analytica (2004))
- Primary Fiscal Balance (PB) - fiscal balance minus interest payments in percent of GDP; from the World Development Indicators database published by the World Bank. In some cases the data was supplemented with World Economic Outlook database from the IMF.
- Population Size (POP) - from World Development Indicator published by the World Bank
- Education (SSEN) - secondary school enrollment as reported in the World Development Indicators from the World Bank.
- Working age population (WORKPOP) - calculated as 1 minus percentage of population below 15 years of age and over 65. From World Bank Indicators by

World Bank.

- External Debt (XDEBT) - from the World Development Indicators database published by the World Bank. Used both as percentage of exports (for Credit Rating Model) and as percentage of GDP (for Fiscal Balance Model).

### 3.6.3 Appendix III: Description of the Practices of Fiscal Transparency

- Accounting System (BEX)- There should be a comprehensive, integrated accounting system which provides a reliable basis for assessing payment arrears. An effective accounting system is a fundamental requirement for transparency because it allows the recording of all government activity and establishes internal control to generate reliable budget execution data.
- Budget Classification (DAS) - Budget classification should be uniform and consistent with Government Finance Statistics (GFS) Manual 2001 (IMF (2001a)). This refers to the classification of budgets according to functional, economic, and administrative categories. Uniform classification of the budget along with use of a standard classification, such as GFS or European Statistical Agency (ESA) classification, makes it easier to get a clearer picture of the budget, government priorities, and magnitude/effectiveness of government programs.
- Budget Coverage (DAS) - Budget documents should cover all fiscal activity including all extra-budgetary transactions and activities of government autonomous agencies in order to provide a comprehensive picture of government finances.
- Budget Realism (DAS) Budget projections should reflect the recent revenue and expenditure trends, underlying macroeconomic developments, and well-defined

policy commitments.

- Contingent liabilities (FR)- Contingent liabilities should be published with budget documents. These are costs which the government will have to pay if a particular event occurs; examples include loan guarantees, indemnities against certain risks, uncalled capital, or legal action. These can pose significant risk to future fiscal balances.
- Debt (FR) - Information on government debt should be regularly published. Most government have better disclosure practices for external debt than local currency debt.
- External audit (BEX) - External audit should be independent, sound, and provided with sufficient resources. There should be effective follow-up of audit findings. A functioning external audit system is a basic requirement for transparency and an essential tool for assuring public accountability.
- Final Accounts (BEX)- Final accounts should be presented to the legislature and published within the following fiscal year. Final accounts should demonstrate compliance with budget, show major causes of deviations, and present an audited fiscal position of the government.
- Fiscal/Macro Risks (MTBF)- Major fiscal risk should be analyzed and reported where possible, including variations in economic assumptions and uncertain costs of specific programs.

- Forward Estimates (MTBF) - Forward estimates at least two years ahead of the budget year should be included in the budget. This provides a medium-term outlook for budgeting and provides a benchmark for budgeting next year.
- Independent Assessment of Forecasts (DAS) - Macroeconomic and fiscal forecasts should be published and independent experts should be invited to assess these forecasts. This would improve the reliability of estimates and avoid surprises due to over optimistic projections.
- Internal Audit (BEX) - Budget execution should be internally audited and audit procedures should be open to review. Effective internal audit is an essential tool for preventing misuse and mismanagement of public funds.
- Medium-term Economic Framework (MTBF)- A medium-term quantitative macroeconomic framework should guide budget projections. This would ensure that fiscal policies are consistent with broader medium-term macroeconomic developments and other policies.
- Mid Year Reporting (BEX)- A mid-year report on budget developments should be published and presented to the legislature. This is an important tool for in-year monitoring of budget implementation and fiscal position.
- New Policy Costs (MTBF) - New policy costs should be clearly distinguished from the existing program costs in the budget documents.

- Policy Objectives (MTBF) - A statement of medium-term fiscal policy objectives (preferably with quantitative targets) should be included in the budget.
- Quasi-Fiscal Activity-Financial (FR)- The government should report any QFAs in the financial sector as part of the budget documentation. These include such practices as subsidized lending, loan guarantees, credit ceilings, and multiple exchange rates. QFAs in the financial sector pose fiscal risks because they weaken the financial institutions and may lead to higher future expenditure due to bail-outs and recapitalizations.
- Quasi-Fiscal Activity-NFPE (FR)<sup>49</sup> - The government should report any QFAs as part of the budget documentation. These include such practices as subsidized goods or services, cross-subsidization, and minimum prices for suppliers. QFAs distort the size of government expenditure, and pose fiscal risk because they may lead to losses at NFPE, requiring direct budgetary support in the future.
- Release of Data (DAS) - Fiscal data should be released in a timely manner with sufficient detail and quality. The best practice is to publish advance release calendars for fiscal data. This improves transparency because discretion in fiscal data release can damage a government's credibility. Governments are likely to be more forthcoming with favorable rather than unfavorable information.
- Tax Expenditures (FR)- Any tax expenditure should be reported comprehen-

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<sup>49</sup>NFPE - Non-financial public enterprises

sively in the budget documents. These include exemptions from the tax base, allowances, tax credits, tax rate reductions, and tax deferrals. Tax expenditures distort the size of government revenue and expenditure.

## Chapter 4

# Are Inflation Expectations Driven by Consumption Experience?

### 4.1 Introduction

Inflation expectations play an important role in both theoretical and policy models. Many models use heterogeneity (of inflation expectations) amongst agents to explain economic phenomena. For example, one can use two types of producers, those who adjust fully and those who follow a rule-of-thumb in order to explain price stickiness. The explanations for the heterogeneity have been varied including non-rationality and information asymmetries. I propose to identify one source of this heterogeneity in household inflation expectations, namely, different inflation experiences due to systematically different consumption patterns.

The question of how inflation expectations are formed is important, particularly in monetary economics where the economic effect of monetary policy is crucially dependent on how expectations are adjusted. Since the introduction of rational expectations, significant attention has been paid to modeling inflation expectations; however, the empirical work on micro-level expectations data has been limited. This chapter is an empirical examination of how household inflation expectations may be formed.

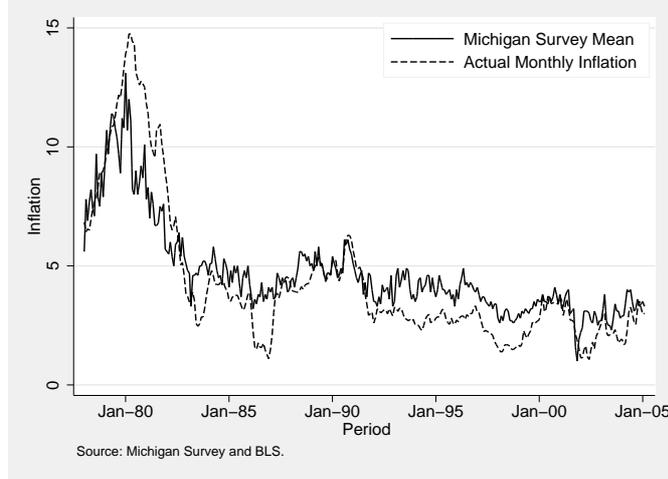
A casual look at data suggests that there is a relationship between expected and experienced inflation. Figure. 4.1 plots the monthly actual inflation and mean of the Michigan Survey of inflation expectations from 1978 to 2005.<sup>1</sup> Assuming that the expected inflation for the representative household is the mean expected inflation from the Michigan Survey, and similarly, the CPI inflation from the Bureau of Labor Statistics (BLS) is experienced inflation for a typical household, then Figure. 4.1 shows a clear relationship between the two. The relationship between the mean expectations and lagged inflation has been well documented in the literature dealing with rationality of inflation expectations.

The heterogeneity of inflation expectations has been observed in various sources of inflation expectations data, including the Michigan Survey, Livingston Survey, and a Survey of Profession Forecasters (SPF). Not only are the mean expectations different

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<sup>1</sup>Michigan Survey is a widely used household survey of inflation expectations data for the U.S. economy. It is produced by the Institute for Social Research, Survey Research Center, University of Michigan. I would like to thank Professor Richard Curtin for generously providing me the household level inflation expectations data.

Figure 4.1: Actual Inflation and Inflation Expectations



between these surveys, there are significant differences within the surveys.<sup>2</sup> More importantly, some papers including Souleles (2001) and Bryan and Venkatu (2001a,b) have shown that expectations vary systematically with demographic variables. At the same time a few papers have also explored how inflation experience varies with demographic variables, although most of these focus on a few demographic variables.<sup>3</sup> These studies together suggest that one possible source of the heterogeneity in expectations may be different household experienced inflation. The argument is that individuals may base their expectations of inflation on the observed price changes of the goods they consume instead of basing it on the published overall inflation figure.

Ideally, we would like to estimate an equation of the form:

$$E[\Pi_{i,t+1}] = \alpha_0 + \alpha_1 \Pi_{i,t} \quad (4.1)$$

<sup>2</sup>See Mankiw and Reis (2003).

<sup>3</sup>See Hamilton (2001) and Hobijn and Lagakos (2003).

where  $\Pi_{i,t}$  is experienced inflation for household  $i$  in period  $t$  and  $E[\Pi_{i,t+1}]$  is the expected inflation for household  $i$  for period  $t + 1$ . The household level inflation expectations data is available in the Michigan Survey but there is no equivalent household level experienced inflation data available. Instead, I use a proxy for experienced inflation based on consumption data available from Consumer Expenditure survey and price data available from the Bureau of Labor Statistics (BLS). This gives us two samples of households, one for the expectations data and one for the experienced inflation data. The households are then matched across the two samples using demographic data available in both datasets. Then I estimate Eq. 4.1 using the matched dataset.

The rest of the paper is organized as follows. The first section will consider some of the related literature. The second section describes the construction of the household specific level of inflation. This will be followed by a discussion of how the two databases –household inflation and Michigan survey– are related. The final sections lay out the estimation methodology, present the results, and suggest some venues for future research.

## 4.2 Related Literature

Many important decisions such as wage negotiations, investment decision, and consumption decision depend on future price expectations. Theoretical models of inflation expectations have played an important role in economics, particularly since

the introduction of rational expectations approach. This approach assumes that not only are the economic agents rational, but they have similar beliefs and knowledge on which these expectations are based. Although these assumptions have mathematical appeal, they do not hold up in the light of micro-data. In particular, surveys of inflation expectations have repeatedly shown that expectations vary considerably across economic agents and different surveys.<sup>4</sup> This has led to development of information based models based on learning.<sup>5</sup> Others have tried to model access to information directly as in Carroll (2002) and Mankiw and Reis (2001 and 2002).

A limited number of studies have empirically addressed the heterogeneity in inflation expectations across households. Bryan and Venkatu (2001a,b) document systematic differences in inflation expectations over demographic data such as age, income, education, race, and gender. Souleles (2001), using Michigan Survey micro-data, finds that individuals' forecasts errors of inflation (i.e. expected inflation minus actual inflation) are correlated with demographic characteristics.

At the same time, many studies have also documented different inflation experiences based on demographic data. For example, Amble and Stewart (1994), using an experimental CPI for elderly in America, show that they experience higher inflation than the reported inflation. This difference is attributed to higher share of expenditure on health care for the elderly and higher price increases in health care costs as compared to overall CPI. Erbas and Sayers (1998), using demographic CPI weights,

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<sup>4</sup>See Mankiw and others (2003) for a recent treatment.

<sup>5</sup>See Sargent (1993) and Evans and Hokapohja (2001) for a review.

conclude that an across-the-board downward adjustment of the CPI could affect the lower income elderly households more severely than others. Hamilton (2000) uses food and non-food expenditure data in the PSID to study the differences in inflation based on race. The study finds that blacks faced lower inflation than whites over the period 1974 to 1991. Hobijn and Lagakos (2003) use data from the consumer expenditure survey (CEX) and CPI price series to study inflation experiences across households. The study finds that cost of living increases are generally higher for elderly and the cost of living of the poor is most sensitive to fluctuations in gasoline prices.

These observations beg the obvious question: can the variability in household inflation expectations be based on different inflation experiences? Carlson and Valev (2003) addresses a similar question using survey data in the context of Bulgaria. Instead of deriving the experienced inflation from reported consumption, the respondents were asked directly about their opinion of inflation over the last year. The study finds that not only are the differences in perception of inflation explained by a combination of relative price shifts and different expenditure patterns, but these perceptions have a strong effect on inflation expectations. If agents are actually basing their expectations on realized inflation, it may also explain the observed sluggishness in adjustment of inflation expectations.

### 4.3 Household Level Experienced Inflation

This section will describe the construction of household specific level of inflation. Although it is widely recognized that an individual household's inflation experience is likely to vary from the inflation number reported by the authorities, the literature on household specific inflation is limited. For example the BLS explains on its website why a hypothetical individual's inflation experience may differ from the published inflation number, and suggests a method to construct an individual's experienced inflation based on relative importance (i.e. consumption weights) and relative price changes.<sup>6</sup> There was a surge in literature on calculating the inflation measure for different demographic groups after the Boskin report (Boskin and others (1996)), which, amongst other things, questioned how well the CPI numbers reflect inflation experienced by different demographic groups. The other area where household specific inflation levels have been important are social welfare analysis, particularly changes in inequality.<sup>7</sup>

I will start with a general discussion of the methodology. The rest of this section will discuss some of methodological issues in using the price indices from BLS and data from the Consumer Expenditure (CE) survey to construct household level experienced inflation. The various issues addressed include selection of households; mapping between the price indices and various commodity codes available in CEX;

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<sup>6</sup>See: "Why Published Averages Don't Always Match An Individual's Inflation Experience" by BLS.

<sup>7</sup>See Cage, Garner, and Ruiz-Castillo (2002) for a review.

and adjustment for durable goods expenditure. This section will conclude with a comparison of calculated household level data to published overall inflation data.

### 4.3.1 Methodology

The basic data required to construct household specific indexes are a vector of relative price changes and a vector of budget shares defined over the corresponding commodity space. Then the household specific price index is calculated as:

$$I_{k,t} = \sum_{j=1}^n w_{k,j} * \frac{P_{j,t}}{P_{j,0}} \quad (4.2)$$

where  $k$  is an index over the households.  $j$  is an index over the commodity space from  $j = 1, \dots, n$ .  $P_{j,t}$  and  $P_{j,0}$  are the values of the price index of commodity  $j$  in period  $t$  and the base period respectively.  $w_{k,j}$  is the budget share of commodity  $j$  for the household  $k$  in the base period.

The household level of inflation is calculated as:

$$\Pi_{k,t} = \frac{I_{k,t}}{I_{k,t-12}} - 1 \quad (4.3)$$

This method is very similar to those used in Hobijn and Lagakos (2003) and Cage, Garner, and Ruiz-Castillo (2002). However, it also differs slightly from the BLS methodology and the earlier methods. First, the BLS changes expenditure weights infrequently; this methodology effectively adjusts the expenditure weights monthly (when we compare the published CPI monthly inflation and the average calculated

household inflation). Unlike Hobijn and Lagakos (2003), I use highly disaggregated data to calculate the household price index. For a comparison, Hobijn and Lagakos (2003) uses 19 expenditure categories while I use over 140 categories.

### **4.3.2 Data Sources**

The consumption weights are derived from the data reported in Consumer Expenditure Survey (CEX) conducted by the BLS. CEX has two components, a quarterly Interview survey and a weekly Diary Survey. Each quarter includes approximately 7,500 sample households (5,000 prior to 1999). In addition to the expenditure information, the survey also collects data on household income and socio-economic characteristics. The Interview survey includes monthly out-of-pocket expenditures such as housing, apparel, or transportation. The Diary survey includes weekly expenditures of frequently purchased items such as food, beverages, or personal care products. This paper focuses on the Interview survey data, but aggregate expenditure categories from the Diary Survey (such as expenditure on food) are included. The households are interviewed up to five times, where the first interview collects household characteristics and each subsequent interview takes place after three months and asks about the expenditure in the past three months. Households can enter the sample any month and leave after the first interview. Since I am interested in shares of expenditure as a percentage of total expenditure, I limit the dataset to households that had at least 4 interviews i.e. for the complete year. Using fewer quarters would

skew the consumption weights in the favor of goods consumed in those quarters. It also ensures that the data reflect as many different categories of consumption as possible and cover a whole year since I am interested in annual inflation.

Overall, about 44 percent of the households in the CEX had sufficient data.<sup>8</sup> The reference period for this study is the month of last interview. The weights are then calculated using the annual expenditure, i.e. in the last 4 quarters summed over the commodity space. As in previous studies, this study excludes expenditure on savings/investments such as insurance policies and financial services. Another issue with the expenditure data is that durables are included on the basis of total cost, so for those households that have a durable purchase, the share of consumption of durables is overstated while it is understated for those who do not purchase a durable. I make adjustments to the expenditure data for durables that will be discussed later in this section.

The next step in calculating household inflation is to define a commodity space. Since there are many more expenditure categories (Universal Classification Codes (UCC)) in the CEX than there are publicly available price series, the commodity space is limited by the price data. The correspondence between prices and commodities is not straightforward and requires some judgment in matching each of the UCCs to

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<sup>8</sup>There was a slight change in the sampling methodology in 1995-1996, as a result the data for January 1996 interviews are unavailable. If I restrict households to 4 quarters in 1996, the sample would have excluded households that had last interviews in January, April, July, and October 1996. So for these months, I allow households that have at least 3 quarters of information. Note: we are still missing the month of January 1996 since there are no households that had a last interview that month.

different CPI price indices. There was a major revision of the price series classification system in 1998 where many older series were dropped and new ones added, so I use different correspondence maps for 1994-97 and 1998-2002.<sup>9</sup> In cases where there was no obvious counterpart for a particular UCC in the commodity space, I assign the next highest aggregate available; for example, there is no price series for health insurance in the new classification system, so I assign that UCC the price code for medical services. I use approximately 140 different price indices, though each household has a lower number of expenditure categories reported.

The final component needed for the inflation calculations are the actual relative price changes. The BLS publishes over 200 price series over a range of items for over 41 geographical areas. The price series data are also location specific, but in order to simplify calculations, I use the US city average price indexes. This simplifying assumption that all households face the same prices for any particular commodity was also used in Garner and others (1996) and Hobijn and Lagakos (2003). The price changes used reflect the year-on-year change for the month of last interview, which also helps in reducing any seasonal effects. The price indices are rebased to December 1997 = 100 where choice of the base period was motivated by the fact that this period exists in both pre-1998 and the new CPI classification systems. So  $P_{j,0}$  in Eq. 4.2 is the value of the price index in December 1997.

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<sup>9</sup>The starting point for the correspondence maps was an unofficial mapping provided by BLS staff, to which I made adjustments to accommodate the 1997 change in price series data. I would like to thank Theisa Garner, Michael Hoke, and Teague Ruder at the BLS for their cooperation. These correspondence maps used between UCCs and price series are available from the author upon request.

### 4.3.3 Durables

One obvious problem with the proposed method is that some households report expenditure on durables in the covered periods and some do not. Since durables are consumed over several periods, households may consume durables without reporting expenditure. For those, which do report durable expenditure, the expenditure is recorded as the total cost of a durable such as a car or a TV. Using the reported expenditure to calculate consumption shares would give an erroneously high weight to consumption on the durable, and the realized inflation will likely be biased downwards because durable inflation has, on average, been lower than non-durable inflation. Similarly, the share on durables would be understated for a household that does not purchase a durable in the relevant period. This poses a problem particularly for automobiles, since the UCCs report the net price of the car instead of monthly payment or other user cost. Households who bought the car in other years do not show any expenditure for that year. There are two ways to deal with this: one is to drop the durable from our calculations and argue that the paper only considers goods for which the consumer shops often and knows the prices. The other option is to impute consumption for each durable.

I impute durable expenditure for broad categories of durable goods based on other household characteristics such as income, household size, and expenditure on other related goods. The idea is to proxy the consumption on durable goods by the average actual expenditure for similar households in the sample. The three durable goods

considered are household durables, audio and video equipment, and new and used motor vehicles.<sup>10</sup>

We want to ask the question how much a household is likely to consume of a particular durable good? Our best guess is the average expenditure on that durable for the similar households. Assuming that similar households maintain a similar ratio of durable to non-durable expenditure, durable expenditures are imputed in two steps. First, I calculate the aggregate annual expenditure on selected groups of durable goods. Then  $\delta_{i,j}$ , the ratio of durable expenditure to non-durable expenditure for durable group  $i$  and household  $j$ , is calculated as:

$$\delta_{i,j} = \frac{DEXP_{i,j}}{TEXP_j - TDEXP_j}$$

where  $DEXP_{i,j}$  is the durable expenditure on group  $i$  for household  $j$  and  $TEXP_j$  and  $TDEXP_j$  are the total expenditure and total durable expenditure respectively for household  $j$ . The resulting data has a zero for those households that have not reported any expenditure for the particular durable. This is particularly the case for expenditure on vehicles where most of the households report zero expenditure. Then I estimate the equation of the form:

$$\delta_{i,j} = \beta_i \cdot D_j + \epsilon_{i,j}$$

using OLS. Where  $\delta_{i,j}$  is the ratio of durable expenditure to non-durable expenditure for durable group  $i$  and household  $j$ .  $D_j$  is the vector of demographic variables for

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<sup>10</sup>This does not cover all durable consumption but covers a large proportion of durable consumption that every household is likely to consume. Some other durables such as computers and sporting equipment are less likely to be consumed by all households.

household  $j$  which includes age, year, income class, education category, race, and marital status. The estimated coefficients  $\hat{\beta}_i$  are then used to impute durable goods using the following equation:

$$IDEXP_{i,j} = \hat{\beta}_i \cdot D_j * (TEXP_j - TDEXP_{i,j})$$

where  $IDEXP_{i,j}$  is the imputed durable expenditure for durable group  $i$  and household  $j$ .

Table 4.1 shows the average actual expenditure and imputed consumption for the three durable categories considered. The starkest difference is for the motor vehicles category, where before adjustment, the category accounted for 30.7 percent of non-durable expenditures; after the adjustment, it accounts for 11.9 percent of the average non-durable expenditure. The imputed durable expenditure on motor vehicles as a percent of total expenditure is 10.5 percent, i.e. the average weight for this commodity, is also much closer to average relative importance (8.5 percent) of this category in the CPI as reported by BLS. For robustness of the results to these adjustments, the main results are also shown using only non-durable expenditure.

#### 4.3.4 Estimated Inflation Experience

The inflation experience for each household  $\Pi_{k,t}$  is estimated using Eq. 4.2 and Eq. 4.3. The monthly average for all households and the BLS reported annual inflation are shown in Figure. 4.2. In order to abstract from the effect of outliers, the median of experienced inflation (CEX) is also shown. The figure suggests that both the mean

Table 4.1: Durable Expenditure

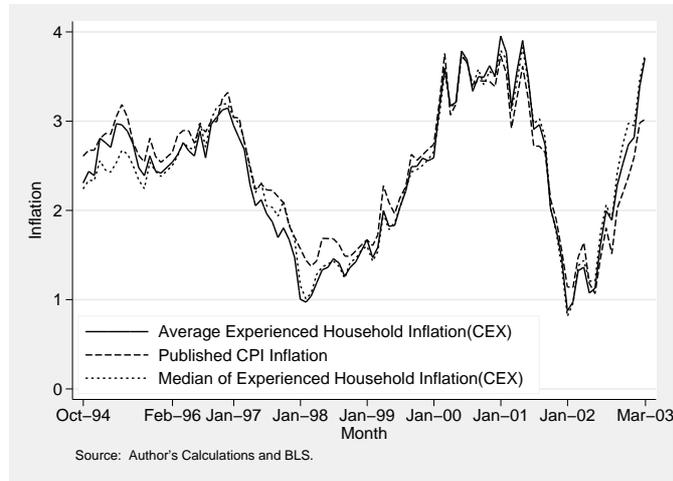
Durables	Household Furnishings	Entertainment Equipment	New and Used Motor Vehicles
(Average in U.S. dollars)			
Actual Cost	1344	667	13270
Imputed Cost	1189	628	4267
(Average in percent of non-durable expenditure)			
Actual Cost	3.5	1.8	30.7
Imputed Cost	3.3	1.7	11.9
(Average in percent of total expenditure)			
Imputed Cost	2.9	1.5	10.5
Relative Importance	4.1	1.7	8.4

and the median of the calculated household inflation closely track the actual data. The correlation coefficient between the mean and actual inflation is 0.95. The small differences were expected because the household sample used is smaller, adjustments were made for durable expenditure, the weights are adjusted more frequently, and finally the mapping between expenditure categories and price indices may be slightly different.

## 4.4 Comparing the Two Databases

This section describes the Michigan survey data, compares the demographic makeup of the two databases, and finally discusses the observed difference in inflation measures across demographic groups.

Figure 4.2: Comparing Actual and Imputed Inflation



#### 4.4.1 Michigan Survey Data

The most widely used inflation expectations data for the U.S. economy is the Michigan Survey Data.<sup>11</sup> This survey directly asks consumers about their expectations for inflation one year ahead. Following Curtin (1996), the Michigan Survey sample is limited at +30% and -5% but instead of recoding to extreme values, I exclude the observations outside this range.

Consumers are asked two related questions about inflation expectations. The first question asks:

“During the next 12 months, do you think that prices in general will go up, or go down, or stay where they are now?”

The next question asks:

“By about what percent do you expect prices to go (up/down) on the average, during the next 12 months?”

<sup>11</sup>Produced by the Institute for Social Research, Survey Research Center, University of Michigan. I would like to thank Professor Richard Curtin for kindly providing the micro-data.

The survey also collects limited demographic information for the surveyed households. The public access micro data includes information on age, gender, education, marital status, income, vehicle ownership, number of kids and adults in the household, and race.<sup>12</sup> This information is also available in Consumer Expenditure Survey (BLS) data, so these demographic variables were used to match similar households across the two samples. Although the CEX survey contains significantly more household specific demographic and socio-economic information, the study was limited to variables that were also available in the Michigan Survey.

#### **4.4.2 Summary of Demographic Variables**

In order to compare the demographic characteristics of the two datasets, Appendix Table 4.6 lists the different demographic categories and the percentage of households that fall into each category. The categories of demographic variables are similar to those in Bryan and Venkatu (2001a) and Souleles (2001) with additional categories for vehicle ownership and number of children. As can be seen from the table, the two datasets are quite similar in term of demographic characteristics.

#### **4.4.3 Inflation Differences Across Demographic Groups**

This section considers the average differences in inflation expectations and inflation experience from their means. In particular, we are interested in seeing if the

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<sup>12</sup>See Survey Research Center (2004).

inflation measures for a particular demographic differ from the overall means similarly across the two datasets. Table 4.2 shows the mean deviation of experienced inflation and expected inflation from their respective monthly averages for eight demographic variables. Figure 4.3 presents the same data in graphic form. One caveat here is that since we are looking at deviations from monthly average, there is significant noise in the mean due to small sample sizes for certain demographic groups. Although the table only shows overall means, the medians were also considered to ensure that the results are not driven by extreme values, which yielded similar results.

Table 4.2 suggests that experienced inflation and expected inflation vary systematically across demographic groups. Further, it also partly indicates that the differences are similar across the two samples, at least in the direction of difference from the mean if not the actual value. For example, if we consider income quartile groups, –both CEX and Michigan Survey calculate the income quartile for each household which reports income– those in the lowest quartile appear to experience higher inflation on average than those in the highest quartile. Similarly, the expectations of inflation are the highest for those in the lowest income quartile. I also calculated inflation-adjusted real incomes for each of those households based on the income and CPI. For comparison, the households were then grouped by their real incomes over a range of income categories. The households with lower real incomes have higher than average inflation experience and expectations, and vice versa.

For age groups, there does not appear to be as clear of a relationship, although

Table 4.2: Deviation from Mean: By Demographic Variables

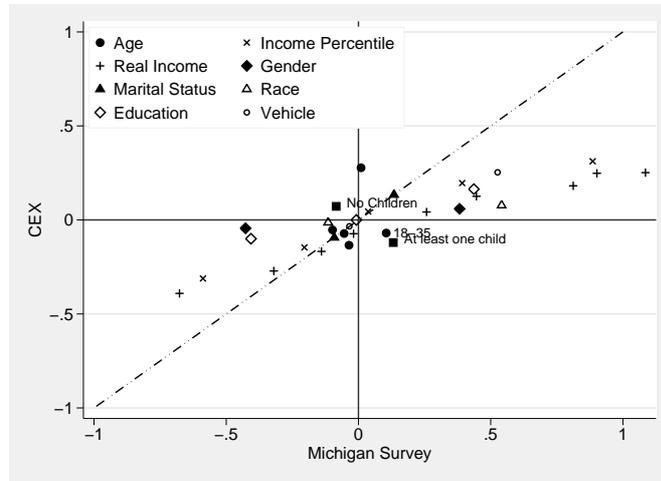
Variable	Description	CEX	Michigan
Age Groups	18-35	-0.07	0.11
	35-45	-0.13	-0.04
	45-55	-0.07	-0.05
	55-65	-0.05	-0.10
	> 65	0.28	0.01
Real Income Groups	< 5,000	0.25	0.90
	≥ 5,000 and < 10,000	0.25	1.09
	≥ 10,000 and < 15,000	0.18	0.81
	≥ 15,000 and < 20,000	0.13	0.45
	≥ 20,000 and < 30,000	0.04	0.26
	≥ 30,000 and < 40,000	-0.07	-0.02
	≥ 40,000 and < 50,000	-0.17	-0.14
	≥ 50,000 and < 70,000	-0.27	-0.32
	≥ 70,000	-0.39	-0.68
Income Quartiles	Lowest 20th percentile	0.31	0.89
	20th - 40th percentile	0.20	0.39
	40th - 60th percentile	0.04	0.04
	60th-80th percentile	-0.15	-0.20
	Highest 20th percentile	-0.31	-0.59
Gender	Male	-0.04	-0.43
	Female	0.06	0.38
Marital Status	Married	-0.09	-0.09
	Other	0.13	0.13
Race	White	-0.01	-0.11
	Other	0.08	0.54
Education	Some High School	0.16	0.44
	Some College	0.00	-0.01
	College Graduate	-0.10	-0.41
Vehicle Ownership	No Vehicle	0.25	0.53
	Own Vehicle	-0.03	-0.03
Children	No Children	0.07	-0.08
	At least one child	-0.12	0.13

(other than the lowest age group) the direction of deviation from mean is the same in both datasets. Similar to earlier findings, the elderly experienced higher than average inflation, which has usually been attributed to the increasing medical costs in the literature. In fact, the average deviation of 0.28 percent is close to the range suggested by Amble and Stewart (1994) and Hobijn and Lagakos (2003) of 0.38 percent, although it should be noted that these papers used the definition of 62 and older as elderly while this paper uses 65 years and older.

It appears that on average, the experienced inflation is higher for females as is expected inflation. The direction of the difference from inflation is similar to findings in Bryan and Venkatu (2001a and 2001b) which were based on a different survey. The difference appears to be more marked in the Michigan Survey, where the difference is 0.71 percent, while for the CEX data the difference is only 0.11 percent. The average difference between households, which reported their marital status as married, and others is almost identical across the two datasets.

In contrast to Hamilton (2001) and Hobijn and Lagakos (2003), I find that on average, non-whites experience higher inflation than average by 0.08 percent although the relationship may vary month to month. Whites experience a lower than average inflation and the difference is more prominent in the Michigan Survey (0.11 percent) than in CEX based experienced inflation data (0.01 percent). This is similar to the finding in Bryan and Venkatu (2001a) where non-whites were found to have higher perceived and expected inflation.

Figure 4.3: Deviation from Mean



The next variable considered is the highest level of education attainment. Households with the highest education seem to have lower than average experienced and expected inflation. At the same time, households with the lowest education levels experience higher than average inflation and have higher than average expected inflation.

The last two variables considered are vehicle ownership and children. Those households with no vehicles appear to experience and expect higher inflation than average. There is no clear correlation between households, which have children, and those that do not between the two datasets. In the experienced inflation dataset, households with no children seem to have higher inflation while in the Michigan Survey households with at least one child have higher inflation expectations. The finding on data based on CEX is in line with Hobijn and Lagakos (2003) which also finds that households with kids younger than 18 seem to face lower inflation than other households

in general.

The analysis in this section suggests that experienced inflation and expected inflation appear to vary systematically across the demographic variables included, with the exception of number of children. One caveat here is that this analysis considered each of the demographic variables separately and there are likely to be interaction between the different variables. The next section will consider the demographic variables jointly and methodically test if inflation expectations are indeed driven by experienced inflation.

## 4.5 Estimation Methodology and Results

Now we can estimate our ideal equation (Eq. 4.1) suggested in the beginning of this paper. The household level inflation expectations data is available in the Michigan Survey and the experienced inflation is proxied by an inflation measure based on the consumption data from the CEX. This gives us two samples of households, one for the expectations data and one for the experienced inflation data. The households in these different datasets are most likely not the same households, so I match different households using the basic demographics available in both datasets. An outline of the estimation methodology is as follows. I first estimate an equation of the form:

$$\Pi_{j,t}^{CEX} = Z_{j,t} \cdot \beta + \epsilon_j \quad (4.4)$$

where  $Z_{j,t}$  is a vector of demographic variables including age, real income, gender, marital status, race, education, vehicle ownership, and whether there are any children in the household.  $\beta$  is a vector of coefficients for each of the demographic variables. There is no reason to believe that the demographic coefficients vary across time, so the equation is estimated only with a complete data set of time dummies.

Other than age and real income, all the other variables are included as dummies with one category excluded. Real income variable is included as log of real income, where real income is calculated as reported income deflated to January 1994 using CPI as the deflator. The dummy variable indicating children was included despite the fact that initial analysis did not show a relationship between experienced inflation and expected inflation for this group. It was included in order to increase the number of household specific demographic variables and it is reasonable to expect that households with children would have different inflation experiences since their consumption is likely to be different from households with no children.

The vector of estimated coefficients  $\hat{\beta}$  is then used to construct a proxy for experienced inflation for each household in the Michigan Survey based on the household demographics for period  $t$ . The final step is to estimate an equation of the form:

$$E[\Pi_{i,t+1}] = \alpha_{0,j} \cdot D_j + \alpha_1 \cdot \hat{\beta}Z_{i,t} + v_{i,t} \quad (4.5)$$

Here  $E[\Pi_{i,t+1}]$ , the dependent variable is the reported inflation expectation for the household in the Michigan Survey.  $D_j$  is a dummy variable which equals 1 if the last

interview for household  $i$  was in month  $j$  and 0 otherwise. The coefficient of interest is  $\alpha_1$  and the hypothesis is that  $\alpha_1$  is close to 1 i.e., experienced inflation influences expected inflation.

Table 4.3 shows the estimated coefficient for all households which have sufficient data. The limiting factor is the income variable, since many households do not report income. The estimated equation includes dummy variables for months since there is significant variation in the average inflation. The  $R^2$  reported is not the regular  $R^2$  but instead is the  $R^2$  contribution of the included demographic variables. It is the calculated  $R^2$  of the equation with monthly means of  $\hat{\beta}Z_{i,t}$  subtracted from both the dependent and the independent variable, which is mechanically equivalent to including monthly dummies.

Table 4.3: Expected Inflation Regressed On Experienced Inflation

	Imputed Durables	Non-Durables
Realized Inflation	1.545 (0.100)***	1.621 (0.120)***
Observations	39549	39549
Demographic Contribution to $R^2$	0.006	0.0046

Each equation includes month dummies. Demographic  $R^2$  was calculated excluding the affect from time dummies and is based on the common demographic variables in CEX dataset and the Michigan Survey dataset.

Standard errors in parentheses \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

The estimated coefficient using all the data is 1.545 and it is highly statistically significant. The  $R^2$  attributed to the included demographic variables is somewhat low at 0.006, but this is quite usual for studies with a large number of observations.

In order to be certain that the results are robust to the adjustment made for durable expenditures, column(2) in Table 4.3 also shows the estimate for inflation experience calculated using only non-durable expenditures. The coefficient is slightly higher at 1.621 and highly significant.

Since there was a major change in the CPI classification system in 1997, Table 4.4 presents the estimate of Eq. 4.5 using data from 1998-2002. The coefficients are smaller, but still larger than 1 and statistically significant. The results in Table. 4.3 and Table. 4.4 show that households' inflation expectation are driven by experienced inflation, with the estimated coefficient ranging from 1.309 to 1.621.

Table 4.4: Expected Inflation Regressed On Experienced Inflation (1998-2002)

	Imputed Durables	Non-Durables
Realized Inflation	1.309 (0.095)***	1.467 (0.111)***
Observations	23452	23452
Demographic Contribution to R <sup>2</sup>	0.0081	0.0074

Each equation includes month dummies. Demographic R<sup>2</sup> was calculated excluding the affect from time dummies and is based on the common demographic variables in CEX dataset and the Michigan Survey dataset.

Standard errors in parentheses \* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%.

## 4.6 Influence of Perceptions

A coefficient of 1.5 suggests that individual experiences are overly influencing inflation expectations. Although it possible that over-adjustment of expectations may

be a result of a knee-jerk reaction, there are several reasons why some commodities may have a higher weight in formation of inflation expectation than justified by their consumption weight. For example, items whose prices are often discussed in newspapers, such as energy prices, may influence expectations more than others. Another possibility is that individuals are more confident about prices of goods for which they shop often, such as food, and thus weigh them more when forming expectations.

Table 4.5: Influence of Food and Energy Prices

	Actual Inflation	Michigan Survey
Energy	0.08 (0.00)***	0.01 (0.01)
Food	0.20 (0.00)***	0.39 (0.04)***
Other	0.71 (0.00)***	0.60 (0.04)***
Obs.	573	326
R <sup>2</sup>	1.00	0.95

Based on the energy, food, and non-food or energy price series available from the BLS.

Table 4.5 shows the results of a simple exercise to determine if individuals weigh commodities differently in the CEX and Michigan Survey. I use the price series available from the BLS for food, energy, and all goods excluding food and energy. A regression of CPI inflation to the component inflations shows how much each category of inflation contributes to inflation on average. Column(2) shows the results of the same regression, but uses the published mean Michigan Survey measure of expected inflation as the dependent variable. It appears that the effect of food prices on inflation expectations is much higher than justified by its coefficient in the CPI

regression. This suggests that there may be other commodities that may also be over influencing inflation expectations. One way of exploring this topic further would be to survey individual about their perception of inflation and ask them directly which prices they have in mind when making the assessment.

## 4.7 Conclusion

This paper proposed a method for calculating household experienced inflation using consumption data from the CEX and item level price series from the BLS. Adjustments were made to the CEX data in order to account for durable expenditures. A comparison of the actual inflation data and the monthly average household inflation data shows that the methodology is sound.

A comparison of the Michigan Survey data and household experienced inflation data shows that inflation experience and inflation expectation for different demographic groups vary systematically across the two datasets. So, I used a two-sample least square estimation method to test if inflation expectations are indeed driven by inflation experience. The analysis shows that inflation expectations are related to past inflation experience by a coefficient of near 1.5. The size of the coefficient is robust to various adjustments made to the experienced inflation data including adjustments for durable expenditure and change in the price classification system. It appears that consumers over-compensate while adjusting their inflation expectations based on their experience.

A fruitful direction of future research would be to explore which commodities may be influencing this relationship the most. One hypothesis would be to test if goods that are often cited in the news, such as gas prices, play a larger role in influencing inflation expectation than justified by their relative importance in CPI inflation.

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## 4.8 Appendices

### 4.8.1 Appendix I: Summary of Demographic Variables

Although the CEX survey contains significantly more household specific demographic and socio-economic information, the study was limited to variables that were also available in the Michigan Survey. In order to compare the demographic characteristics of the two dataset, Table. 4.6 lists the different demographic categories and the percent of households that fall in each category. The categories of demographic variables are similar to those in Bryan and Venkatu (2001a) and Souleles (2001) with additional categories for vehicle ownership and number of children.

The CEX households are on average older with the youngest (18-35) cohort accounting for only 18 percent of all households as compared to the Michigan survey where it account for nearly 30 percent of the households. The percent of household in other categories are remarkably close except for the oldest category.

The households were also divided into different groups based on their income. In both databases, many households do not report complete information on income. The table shows a breakdown of household by both real income range and quartiles of income. Real income is calculated as the reported income deflated using the CPI and January 1994 as base period. Then the real income groups are constructed using income ranges as shown in Table 4.6. Both CEX and Michigan survey also report an income quartile based on the distribution of households in the interview period. There

are no drastic differences in shares of different groups although the CEX dataset seems to have proportionally more households in the lower real income categories, which is also reflected in the lower average real income figure for CEX households.

A proportionally higher number of head of households are male in the CEX survey than in the Michigan Survey. This may be because the Michigan survey is a phone survey and it records the gender of the person answering the phone and not the actual head of the household.

The proportion of household that are married is remarkably close across the two databases as is the distribution of household across race. For education, most households in the CEX sample have attended college while in the Michigan Survey close to 40 percent of respondents state they are either college graduates or at most high school graduates. The last two household characteristic variables are whether the household owns a car or has a child. There is not much difference between the two samples over these two variables. The overall conclusion from these comparisons is that the two datasets are quite similar in term of demographic characteristics.

Table 4.6: Demographic Variables Across the Two Samples

Variable	Description	CEX (In percent of households)	Michigan
Age	Actual Age	50.9	45.7
Age Groups	18-35	18.4	27.7
	35-45	22.4	24.3
	45-55	21.2	19.9
	55-65	14.0	12.0
	> 65	24.0	14.5
Real Income Groups	< 5,000	8.3	1.6
	≥ 5,000 and < 10,000	11.1	3.7
	≥ 10,000 and < 15,000	10.3	6.1
	≥ 15,000 and < 20,000	8.9	6.7
	≥ 20,000 and < 30,000	14.3	14.7
	≥ 30,000 and < 40,000	10.7	14.3
	≥ 40,000 and < 50,000	8.5	12.1
	≥ 50,000 and < 70,000	11.2	14.7
Income Quartile	≥ 70,000	11.5	17.8
	Lowest 20th percentile	12.8	11.6
	20th - 40th percentile	15.6	15.6
	40th - 60th percentile	16.3	19.2
	60th-80th percentile	17.7	21.3
	Highest 20th percentile	19.6	23.9
Gender	Male	56.4	47.2
	Female	43.6	52.8
Marital Status	Married	58.6	59.2
	Other	41.4	40.4
Race	White	84.5	81.0
	Other	15.5	16.8
Education	Some High School	16.8	36.7
	Some College	56.4	23.1
	College Graduate	26.8	39.5
Vehicle Ownership	No Vehicle	12.1	5.9
	Own Vehicle	87.9	90.1
Children	No Children	62.9	60.8
	At least one child	37.1	39.1

# Vita

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