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**The Size and Development of the Indian Shadow Economy  
and a Comparison with other 18 Asian Countries: An  
Empirical Investigation**

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## 1. Introduction

The gap between the observable and the actual has for long been the anathema of social scientists. Over the years this has led to the conceptualization of the ‘hidden economy’. Black, shadow, underground, unobserved, unofficial, subterranean, unrecorded, informal, irregular, second, twilight, parallel - synonyms used for the ‘hidden economy’ seem to highlight the fact that this concept, which essentially captures the activities beyond measurement by fiscal or economic factors, is itself replete with differences in definitions and pathologies.<sup>1</sup> The hidden economy basically consists of legal and illegal activities outside the reach of the government.<sup>2</sup> Studies show that underground activities have been on the rise since the ‘70s when the presence of government activity became stronger in the economies around the world. With increase in tax rates to finance larger public spending programs, the desire to escape taxes and regulatory restrictions also gained in prominence (Tanzi and Schuknecht (1997)). To quote Tanzi (1999) “Thus a good case could be made that what came to be called as the underground economy was a phenomenon to worry about. Newspaper articles were ready to accept the notion that the underground economy had increased significantly over the years, thus casting doubts on the accuracy of the official economic statistics and raising the prospect that large increases in tax revenue were possible, if only the underground could be taxed”. Such media attention brought the nexus of the black economy into the public glare creating a consciousness about the gravity of the phenomenon all over the world. Such a role of the media is something we shall discuss in section 5 of this paper. The remnant parts of the paper are organized in the following manner. The next section i.e. Section 2 gives a synoptic view of the previous literature. Sections 3 and 4 dwell on the methodology of the paper in detail. Section 5 is divided in to four subsections. The first subsection lists

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<sup>1</sup>) Compare e.g. in the Economic Journal, vol. 109, no. 456, June 1999 the feature “controversy: on the hidden economy”.

<sup>2</sup>) The literature about the “shadow”, “underground”, “informal”, “second”, “cash” or “parallel”, economy is increasing. Various topics, on how to measure it, its causes, and its effect on the official economy are analyzed. See for example, survey type publications by Frey and Pommerehne (1984); Thomas (1992); Loayza (1996); Pozo (1996); Lippert and Walker (1997); Schneider (1994a, 1994b, 1997, 1998); Johnson, Kaufmann, and Shleifer (1997), and Johnson, Kaufmann and Zoido-Lobaton (1998a); and for an overall survey of the global evidence of its size in terms of value added Schneider and Enste (2000).

out the basic data variables used in the analysis, the second one tests for the presence of unit roots, the third one documents the nature of the hidden economy estimates obtained by the MIMIC methodology, and the fourth deals with the rate of political and institutional factors. Section 6 deals with an international comparison of the shadow economy of other Asian countries and in section 7 a summary and a policy conclusion are given.

## **2. A short Review of the Literature of the Indian Shadow Economy**

The presence of the black economy in India first came to the forefront with the release of the Wanchoo Committee Report (Government of India, Ministry of Finance, 1971, p.6), that referred to the phenomenon as a “cancerous growth in the country’s economy which if not checked in time, will surely lead to it’s ruination”. The Venkatappiah Committee Report (Government of India, 1974), which focussed on the self-removal of excise taxes also felt “free to confess that we are not prepared for, and are, therefore, painfully surprised at, the range, diversity and, in certain segments of production, almost the universality of the evasion which is practiced by those who produce the goods”. Besides taxes, the extent of regulation rampant in the economy encouraging the proliferation of the hidden economy was highlighted way back in 1979 (Government of India, Ministry of Finance, 1979) by the Dagli Committee Report. This report documents the web of regulation that seems to have stifled industrial licensing, import licensing, controls on prices and distribution channels of goods and services, credit controls and other measures in India for some decades now. Given the particulars it might not be too surprising to comment that capturing the size of the hidden economy might also help in ascertaining the amount of corruption and inefficiency in the system to a certain extent.

## **3. The Definition of the Shadow/Hidden Economy: An Attempt**

Now how do we define the hidden economy? Experts have realized over the years that, trying to arrive at a solitary definition of the underground or hidden economy is a mammoth if not an irrational and inhibiting exercise. A better option would be to identify and list the major definitions, causes, characteristics and also techniques for the

measurement of the hidden or shadow economy in literature. Vito Tanzi (1999), acknowledged for his work on the US hidden economy in the early '80s, suggests that the shadow economy crops up because of presence of activities that are difficult to measure and tax, like household work and also criminal and illegal activities. Schneider (1986) sums this point succinctly by defining the underground economy as "all economic activities that contribute to the value added and should be included in national income in terms of national accounting conventions but are presently not registered by national measurement agencies". Bhattacharyya (1999) describes the hidden economy as reflected by the unrecorded national income "calculated as the difference between the potential national income for the given currency in circulation and the recorded national income". Bagawacha and Naho (1995) consider it as a combination of informal (small-scale production and distribution units), parallel (illegal production of legal activities) and black market activities (production and distribution of market and non-market goods forbidden by the government). Acharya (1985) in the Indian context refers to the black economy as "the aggregate of incomes which are taxable but are not reported to the tax authorities" and also "the extent to which estimates of national income and output are biased downwards because of deliberate, false reporting of incomes, output and transactions for reasons of tax evasion, flouting of other economic controls and related motives". From the above discussion it can be inferred that the shadow or hidden economy deals with the portion of the income earned from legal and illegal activities that cannot be accounted for by the standard measurement procedures used in compilation of national income accounts. This can be taken as a relatively broad definition of the 'underground economy'.

Hence, a commonly used working definition is: all currently unregistered economic activities, which contribute to the officially calculated (or observed) Gross National Product.<sup>3)</sup> Smith (1985, p. 18) defines it as "market-based production of goods and services, whether legal or illegal that escapes detection in the official estimates of GDP." As these definitions still leave open a lot of questions, table 1 may be helpful for

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<sup>3)</sup> This definition is used for example, by Feige (1989, 1994), Schneider (1994a), Frey and Pommerehne (1984), and Lubell (1991).

developing a better feeling for what could be a reasonable consensus definition of the legal and illegal underground or shadow economy.

From table 1 it becomes clear that the shadow economy includes unreported income from the production of legal goods and services either from monetary or barter transactions - hence all economic activities which would generally be taxable were they reported to the state (tax) authorities. In general, a precise definition seems quite difficult, if not impossible as „the shadow economy develops all the time according to the 'principle of running water': it adjusts to changes in taxes, to sanctions from the tax authorities and to general moral attitudes, etc.“ (Mogensen, et. al. 1995 p. 5).

### **Methods of Measuring the Hidden Economy**

This study is different from the earlier underground economy studies conducted in the Indian context by Gupta and Mehta (1981), Chopra (1982), Acharya (1985), Bhattacharyya (1999), and Bhattacharyya and Ghose (1998) in the following way:

- a) While Acharya (1985), Bhattacharyya (1999), and Bhattacharyya and Ghose (1998) used traditional cash demand estimation methodology, which has been criticized in the literature for its focus on just one facet of the hidden economy, this work uses the MIMIC model. Gupta and Mehta (1981) have used a physical input approach where as Chopra's method is in close line with the one suggested by Kaldor (1956).<sup>4</sup>
- b) The uniqueness of the study hinges on the fact that it addresses the crucial question: Does an increase in the presence of civic institutions like media have a contractionary effect on the size of the hidden economy of a democracy like India?

In this paper, we attempt to estimate the hidden economy by Multiple Indicator Multiple Cause approach (MIMIC). Frey and Weck-Hanneman (1984) were the first to employ this methodology for the estimation of the hidden economy of a cross-section of 17

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<sup>4</sup>) Kaldor (1956) tried to estimate the size of the hidden economy in India, by estimating the income that avoided the income tax.

OECD countries for the period of 1960-78. They borrowed from the statistical theory of unobserved variables developed by the likes of Zellner (1970), Goldberger (1972) and Joreskog and Goldberger (1975) which considers multiple causes and multiple indicators of the phenomenon to be measured and used a factor-analytic approach to measure the hidden economy as an unobserved variable over time. The unknown coefficients were estimated separately through a set of structural equations with the indicator variables being used to capture the effect of the unobserved variables indirectly. Through their analysis Frey and Weck-Hanneman (1984) arrived at a ranking of OECD countries on the basis of the size of their underground economies- e.g. in the late '70s Scandinavian and Benelux countries were seen to have very large hidden economies followed by US in the middle rung and then by Switzerland and Japan which exhibit very small sizes of underground activity for that period. Also growth rates wise, Denmark, Belgium and Italy's hidden segment seem to have grown at an above average pace while Canada, UK and USA's hidden economy was found to be below the average rate. Another study by Aigner, Schneider and Ghosh (1988) uses a variant of the MIMIC approach- the DYMIMIC (the dynamic multiple-indicators multiple-causes approach) to assess the size of the US hidden economy for the time period 1939-1982. The results of this study have found a peak in the US hidden economy size around 1943-44 and a trough in 1967-68.

In recent years a lot of work has been done using the unobserved or latent variable approach, particularly in the context of New Zealand and Canada. Giles (1999a, 1999b), Giles and Caragata (2001), and Giles and Tedds (2002) have used the time series data for the New Zealand and the Canadian economy, to arrive at hidden economy estimates, using the MIMIC approach.

#### **4. Methodology**

This paper estimates the size of the unobserved hidden or underground economy in India using a factor- analytic Multiple Indicator Multiple (MIMIC)<sup>5</sup> variable approach. The empirical methodology that is used has been adopted from the statistical theory of

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<sup>5</sup>) See Zellner (1970), Goldberger (1972), Joreskog and Goldberger (1975)

unobserved variables, which focus on the multiple determinants or causes contributing to the development of the hidden economy as also the factors, which can be conceived as the indicators of its presence. The estimation of the size of the hidden economy over time, which is the latent or unobservable variable in the model, is done using a factor-analytic approach. The MIMIC model actually is a variant of the LISREL (linear Independent Structural Relationships) models of Joreskog and Sorbom (1993a,b) and others. These kinds of models can only yield a time-series index for the latent variables expressed as percentage of the measured GDP. After that this ordinal index has to be converted into a cardinal series of values of hidden economy sizes by scaling up the ordinal values to some cardinal value that has been obtained in the past through other methods of estimation like the electricity or the currency demand approach.

The MIMIC model equations can be stated as:

$$y = \lambda\eta + \varepsilon \quad (1)$$

$$\eta = \gamma'x + \zeta \quad (2)$$

where,  $y$  is a column vector of 'p' indicators of the latent variable,  $\eta$ , and  $x$  is a column vector of the 'q' "causes" of  $\eta$ . In other words, equation (1) is the measurement model for  $\eta$  and equation (2) is the structural equation for the latent variable,  $\eta$ .  $\varepsilon$  is a (p x 1) measurement error while  $\zeta$  is the scalar structural error. It is assumed that  $\zeta$  and all the elements of  $\varepsilon$  are mutually uncorrelated, with  $\text{Var}(\zeta) = \psi$ , and  $\text{Cov}(\varepsilon) = \Theta\varepsilon$ .

Substituting (2) into (1), the MIMIC model can be conceived as a p-equation multivariate regression model that takes the standard form,

$$y = \Pi x + z, \quad (3)$$

where  $\Pi = \lambda\gamma'$ ,  $z = \lambda\zeta + \varepsilon$ , and  $\text{Cov}(z) = \lambda\lambda'\psi + \Theta\varepsilon$ .

The p-equation model in (3) seems to have a regression matrix of rank equal to one and an error covariance matrix that is similarly constrained. The first condition is typical in simultaneous equation models where the removal of a few exogenous variables from the structural equation might cause a part of the reduced form coefficient matrix to be short-ranked. The singularity property of the error covariance matrix develops because for the measurement model to be estimated it has to be normalized first. This implies that the estimation of (1) and (2) can be carried only after (1) is normalized by setting one element of  $\lambda$  to a pre-assigned value. This justifies our contention that only ordinal

estimates can be obtained from this exercise i.e. we obtain relative vis-à-vis level estimates. We estimate the model using the Maximum Likelihood Estimation procedure. We use different combinations of the causes and indicators to arrive at different hidden economy estimates. For the indicators, on the whole we use the growth rate of real GDP of the economy and the cash to M3 ratio of the economy or the level of cash circulation in real terms in the economy. The causal variables are chosen as different combinations from the set of variables including inflation, the number of persons working in the public sector and the ratio of indirect taxes, direct taxes and corporate taxes over GDP in the five different MIMIC specifications that we will dwell upon in this chapter. After obtaining the ordinal series, cardinal estimates are obtained by calibration to some other hidden economy estimate obtained from other studies.

As we have maintained earlier, the last empirical exercise intends to test the effect that civic institutions like media, political institutions or characteristics the growth of the hidden economy estimates. The regression equation for this model takes the standard form:

$$\Delta h_t = a_t + bn_t + cp_t + \varepsilon_t \quad (4)$$

where  $\Delta h_t$  represents the increment in the size of India's hidden economy at time period 't',  $n_t$  refers to the total newspaper circulation per capita of India in time period 't'. The variable  $p_t$  consists of two political characteristics: the election, a binary variable that equals one if a Parliament election takes place in year 't' and a variable representing the government characteristics in terms of coalition measuring the proportion of year 't' where a coalition government rules India. One may think that during the time of the election the government may try to curb the size of the hidden economy. So, we would expect the coefficient on this variable to be negative. The error term is denoted by  $\varepsilon_t$ .

## 5. Data and Empirical results

### 5.1 Description of the Variables

This paper basically uses two sets of variables- (1) the variables that enter as the causes and indicators in the MIMIC model (2) the variables like newspaper circulation and the



political characteristics that come into the picture in the final stage of our econometric exercise where we try to study the effect of civic institutions like the media and the political institutions like coalition governance and political externalities like special election year behavior. The data sources for these variables are listed in the Data Appendix. Table 2 lists out a detailed account of the different variables used for the MIMIC specification and also their full names since convenient abbreviations are being used otherwise throughout this paper.

## **5.2 Unit Root Tests**

The MIMIC approach might suffer from the standard problem of data non-stationarity. To correct for this problem we have conducted a series of Augmented Dickey Fuller (ADF) tests to check for the presence of unit roots in the data variables. The lag-length for the ADF tests is selected by the procedure suggested by Campbell and Perron (1991). Among the casual variables used in our analysis, indirect taxes over GDP and the number of people in public employment have been found to be I(1) variables at 10 percent levels of significance while among the indicator variables both the cash to M3 ratio and the level of real currency seem to be I(1) variables. For all these four variables the first differences have been considered in our analysis. Table 3 gives the relevant unit root test results.

## **5.3 The MIMIC Model's Estimates of the Hidden Economy of India**

In this sub-section we shall present the hidden economy estimates of four different models using varied combinations of causal and indicator variables. The combinations as also the estimation results are shown in Table 4. In these models we have tried to study the hidden economy determined by inflation, the first difference of indirect tax to GDP ratio, the first difference of the number of public employees as also either the direct tax to GDP or the corporate tax to GDP ratios. The indicators used include the growth of real GDP per capita and either the first difference of the currency to M3 ratio or the first

difference of the real level of currency in the economy. Model 1 and 3 focus on the use of the growth rate of real GDP and the first difference of the real level of currency as the two indicator variables with Model 1 (Model 3) using the inflation rate, the first difference of the number of public employees and the indirect tax and the corporate tax (direct tax) to GDP ratios as the causal variables. As the Table 3 estimates seem to suggest, in both these models inflation and the number of public employees exhibit a negative and significant effect on the size of the hidden economy in India. The contractionary effect of the increase in number of public employees on the hidden economy might be conceived as a result of an increase in the number of secure and official full-time jobs in the society which might act as a kind of substitute for part-time jobs or illegal occupations all of which add to the size of unaccounted incomes. The number of public employees however is a variable that is greatly different from the ratio of public employment to the total employment that can be better explained as a proxy of the level of regulation in the economy and has often been found to possess a positive sign in the hidden economy literature. The sign of the inflation variable can be explained by the fact that with increase in inflation the real incomes of families might fall and this might prompt more people to join the official labor force. One example one can borrow from history to explain this fact is the case of Lebanon where hyperinflation and the deterioration in the local currency, prompted a considerable number of Lebanese to join the labor market in order to make up for declining family incomes. In fact, the total labor force increased by 54.4 percent between 1970 and 1987 against an increase in the resident population amounting to 35 percent only. In the literature however inflation has been found to exhibit both positive or negative impact on the hidden activities because in the face of inflationary pressures whether the public, whose real incomes have declined will opt for the official labor force or the underground economy, will depend on other factors like tax morality, culture as also future expectations among the populace. As a study across our models seems to suggest, in India inflation generally seems to have exerted a negative effect on the size of shadow activities, though in model 2 and 4 (where we use the cash to M3 ratio as one of the indicators along with the growth rate of Real GDP) we do find a positive though insignificant relation between the two. Both the indirect tax to GDP ratio and the direct/corporate tax to GDP ratios in India seem to

exhibit an expected positive effect on the hidden economy size. This seems to endorse the view in the literature that an increase in tax burdens is one of the prime reasons for the ballooning of the underground activities over time around the globe.

Table 5 represents various diagnostic statistics for our estimated models. In almost all the models, the diagnostic statistics give a satisfactory result in terms of model fit. As has already been mentioned in this paper earlier, a cardinal series needs to be generated from the ordinal index after its estimation. This can be done by scaling the available ordinal series using 'benchmark estimates' from other studies (Schneider 2000) or by estimating an cardinal series through some other approach say the physical indicator approach or the cash demand approach (Giles 1997a) and using values from it to calibrate the ordinal series obtained by the MIMIC approach. In the present paper we adopted the first option. We have used Bhattacharyya's (1999) hidden economy estimate for India, of 22.5 percent for 1989-90, to scale up our ordinal hidden economy series to arrive at the complete cardinal underground economy sizes for India. The implied hidden economy series are plotted in Figure 1 for both Model 1 and Model 2. Table 6 presents the size of the hidden economy as a percentage of measured GDP where as Figure 1 provides an annual time-series of the India's hidden economy, as a percentage of measured GDP. This series was generated by multiplying the causal variables' data, by their associated estimated coefficients (the elements of  $\square$  in equation (2)) as shown for MIMIC Model 2 in Table 4. The size of the hidden economy has increased from 8.99 percent (1960/61) to 23.20 percent (1997/98) over the time period under study.

#### **5.4 The role of Political and Institutional Factors**

In this sub-section, we present the result from estimation of equation (4). The result is presented in Table 7. Our results show that irrespective of the model, newspaper circulation exerts a negative significant impact on the increment in the size of the hidden economy. If one interprets the hidden economy as the level of corruption, it tells us that an increase in the public voice (as captured by per capita circulation of newspaper), the extent of corruption is negatively associated. Kaufmann (1999) considers knowledge and information, leadership and collective action as the prime weapons with which to tackle

corruption. This translates to a need for better-defined civic institutions and advocacy agents like the media. Such reform in society can be effectively achieved only if it is a concerted effort of the government, the media and other civic institutions. Stapenhurst (2000) provides a terse portrayal of the link between an active media and the amelioration of corruption as also the shadow activities of the economy. He says that journalists can exert tangible and intangible pressures for cleaner and more broad-based governance. The tangible effects might be in the form of press reports that bring down governments or lead to resignation of prominent officials in government office while the intangible effects might be in the form of the creation of sentiments in the society that enhance political pluralism, encourage public debate and dialogue and force accountability in to the lives of politicians and public officials, through reactionary and objective journalism (Stapenhurst 2000). This is basically the kind of idea that has also been popularized by the civic journalism movement in recent years. Responsible and strong journalism can actually open the eyes of the public and even the government at times to the yawning flaws in policy, laws and regulations, all of which encourage the prevalence of corruption and shady governance and might swing the mood of the nation or state towards hard hitting policy reform. That is why this paper contends that the media and other civic institutions might actually play a more than passive role in bringing forth a reduction in the levels of underground or shadow economic activities that take place within a country. India, which is a nation with high corruption levels but where fortuitously we still have an independent press that is out of the reach of state control, might be the ideal ground where such a hypothesis can be tested. This paper also dwells briefly on the effect that political factors might have on the size or on the rate of growth in the size of the underground economy in India.

Our results also demonstrate that during the election year the size of the hidden economy falls. The change in the size of the hidden economy is around 0.03 lower in the election year than compared to no-election year. The change in the size is also smaller in case of coalition governments than compared to a single-party government in power.

## 6. The Shadow Economy and Shadow Economy Labor Force of 18 Asian Countries

For single countries and sometimes for a small group of countries (like some OECD or transition countries) research has been undertaken to estimate the size of the shadow economy and shadow economy labor force using various methods and different time periods. In the following an attempt is made to estimate the size and development of the shadow economy and shadow economy labor force of Asian countries from the beginning to the end of the 90s. Hence, to our opinion, for the first time an attempt is made to estimate the size of the shadow economy and shadow economy labor force of major Asian countries with the same estimation method for the same time period.

To estimate the size and development of the shadow economy the Currency Demand and the Model (MIMIC) approach are used for 18 Asian Countries. The results are presented in the left part of Table 8. If one first starts with the latest results (2000/2001) the largest shadow economy has Thailand with 51.9% of official GDP, followed by Sri Lanka with 43.7% and the Philippines with 42.6%. In the middle-field is India with 22.8%, Israel with 21.9% and Taiwan with 19.6%. At the lower end are China with 13.4%<sup>6)</sup>, New Zealand with 12.9% and Japan with 11.3% (compare also Figure 2). If we turn to the development of the shadow economies for these 18 Asian countries over time, we see on average the shadow economy of these Asian states was 20.6% in the year 1989/90, rose to 22.8% in the year 1994/95 and to 26.1% in the year 2000/2001. On average the shadow economy of these 18 Asian countries rose over the years 1989/90 to 2000/2001 by 5.2 percentage points in official GDP, a quite a remarkable increase. This increase can also be seen by looking at single countries, e.g. for example by Bangladesh, which had a shadow economy of 26.2% in the year 1989/90 and it rose to 34.9% in the year 2000/2001; or in Thailand, where the shadow economy increased from 44.2% in 1989/90 to 51.9% in 2000/2001.

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<sup>6)</sup> The calculation of the shadow economy for China is very difficult and the values may be questioned because only a part of China has so far been developed into a market economy. A great part of China belongs still a planed economy and due to this mix of systems the calculated figures may be not very reliable.

Having examined the size and rise of the shadow economy in terms of value added over time, the analysis in the right part of Table 8 focuses on the „shadow“ labor market, as within the official labor market there is a particularly tight relationship and “social network” between people who are active in the shadow economy.<sup>7)</sup> Moreover, by definition every activity in the shadow economy involves a “shadow” labor market to some extent: Hence, the “shadow labor market” includes all cases, where the employees or the employers, or both, occupy a „shadow economy position“. Why do people work in the shadow economy? In the official labor market, the costs firms (and individuals) have to pay when “officially” hiring someone are increased tremendously by the burden of tax and social contributions on wages, as well as by the legal administrative regulation to control economic activity.<sup>8)</sup> In various OECD countries, these costs are greater than the wage effectively earned by the worker – providing a strong incentive to work in the shadow economy. More detailed theoretical information on the labor supply decision in the underground economy is given by Lemieux, Fortin, and Fréchet (1994), who use micro data from a survey conducted in Quebec City (Canada). In particular, their study provides some economic insight into the size of the distortion caused by income taxation and the welfare system. The results of this study suggest that hours worked in the shadow economy are quite responsive to changes in the net wage in the regular (official) sector. Their empirical results attribute this to miss-allocation of work from the official to the informal sector, where it is not taxed. In this case, the substitution between labor-market activities in the two sectors is quite high. These empirical findings clearly indicate, that “participation rates and hours worked in the underground sector also tend to be inversely related to the number of hours worked in the regular sector“ (Lemieux, Fortin, and Fréchet 1994 p. 235). These findings demonstrate a large negative elasticity of hours worked in the shadow economy with respect both to the wage rate in the regular sector as well as to a high mobility between the sectors.

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<sup>7)</sup>Pioneering work in this area has been done by L. Frey (1972, 1975, 1978, 1980), Cappiello (1986), Lubell (1991), Pozo (1996), Bartlett (1998) and Tanzi (1999).

<sup>8)</sup>This is especially true in Europe (e.g. in Germany and Austria), where the total tax and social security burden adds up to 100% on top of the wage effectively earned; see also section 5.1.

Illicit work can take many shapes. The underground use of labor may consist of a second job after (or even during) regular working hours. A second form is shadow economy work by individuals who do not participate in the official labor market. A third component is the employment of people (e.g. clandestine or illegal immigrants), who are not allowed to work in the official economy. Empirical research on the shadow economy labor market is even more difficult than of the shadow economy on the value added, since one has very little knowledge about how many hours an average “shadow economy worker” is actually working (from full time to a few hours, only); hence, it is not easy to provide empirical facts.<sup>9)</sup>

The following results of portraying the shadow economy labor force are based on the World Bank database on informal employment in major cities all over the world as well as on other sources (see footnote 8). The values of the shadow economy labor force are calculated in absolute terms and in percent of the official labor force under the assumption, that in rural areas the shadow economy is at least as high as in the cities. This is a conservative assumption, as in reality the shadow economy will most likely be even larger in rural areas.<sup>10)</sup> The following results are preliminary and should be treated as a first attempt to calculate the shadow economy labor force.

If we consider the size of the shadow economy labor force in % of the “official” labor force, we again see, that Thailand has for the year 1989/90 by far the biggest shadow economy labor force with 40% of the official one (compare also figure 3), followed by Indonesia with 31.3% and Sri Lanka with 31.3%. In the middle field is Malaysia with 25.1%, China with 20.5% and Korea (South) with 19.6%. At the lower end is New Zealand with 9.2%, Australia with 8.1% and Japan with 7.1% of the “official” labor

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<sup>9)</sup>For developing countries some literature about the shadow labour market exists, e.g. the latest works by Dallago (1990), Pozo (1996), Loayza (1996), especially Chickering and Salahdine (1991).

<sup>10)</sup> This assumption, that the shadow economy labor force is at least as high as the countryside than in major cities, is a very modest one and is supported by Lubell (1991) and Bartlett (1998). Some authors (e.g. Lubell (1991), Pozo (1996) and Chickering and Slahdine (1991)) argue that the shadow economy labor force is up to twice as high on the country side compared to the one of the major cities. But as there exists no (precise) figures about this ratio the assumption of equal size may be justified arguing that such a calculation provides at least minimal figures.

force. From this result one can see that the shadow economy labor force has reached quite a considerable size and if we finally consider the absolute terms (people in millions), of course, the great nations have the biggest shadow economy labor force, e.g. China with 152.4 millions of “full-time shadow economy workers”, followed by India with 117.2 millions of “full-time shadow economy workers” and then by Indonesia with 30.7 millions of “full-time shadow economy workers”.<sup>11)</sup>

## **7. Summary and Policy Conclusions**

The basic findings of the paper can be summarized as follows:

- 1) The size of the hidden economy in India has shown an increasing trend over the years, varying from 8.9% (1960/61) to about 23% (1997/98).
- 2) An increased growth of newspapers translate to cleaner governance, e.g. to less amount of shadow economy activities in the economy.
- 3) If one compares the size of the shadow economy of India with other Asian states, the shadow economy of India is in the lower end and in a lot of countries the shadow economy like Korea or Bangladesh is much higher.
- 4) The average size of the shadow economy of 18 Asian countries in the 1989/90 was 20.6% and in 2000/01 rose to 26.1%, which means an increase of 4.5 percentage points over these 10 years.

In general, analysis of this paper shows that political institutions may be quite influential with respect to the size of the shadow economy and corruption. The better democracy is functioning the more convinced voters are that their taxes are used in the way they wish, the lower is the size of the shadow economy. This is a first and tentative result and has to be confirmed with additional empirical and theoretical research.

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<sup>11)</sup> It should be clearly emphasized, that the following values have been calculated under the extreme assumption, that a “full-time shadow economy worker” is as productive as his colleague in the official economy. If this were not the case, the figure would even increase. Moreover the assumption of a full time shadow economy worker is extreme. Most people working in the shadow economy have an “official” job, too, so that the figure of “full time shadow economy workers” is an artifact – being done the check how many jobs the shadow economy occupies!



**Table 1: A Taxonomy of Types of Underground Economic Activities<sup>1)</sup>**

Type of Activity	Monetary Transactions		Non Monetary Transactions	
Illegal Activities	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud		Barter of drugs, stolen goods, smuggling etc. Produce or growing drugs for own use. Theft for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
Legal Activities	Unreported income from self-employment; Wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbor help

<sup>1)</sup> Structure of the table is taken from Lippert and Walker (1997, p. 5) with additional remarks.

**Table 2: Index of Variables Used in MIMIC Model**

Names of the variables used	Description of the variables used
INDICATOR VARIABLES	
grgdp	Growth rate of Real GDP
cashm3	The currency to M3 ratio
dcashm3	The first difference of the currency to M3 ratio
rcurr	the level of real currency in the economy
drcurr	the first difference of level of real currency in the economy
CAUSAL VARIABLES	
inflation	the log of the ratio of current year's CPI to previous year's CPI
corgdp	the ratio of total corporate taxes to nominal GDP
dirtgdp	the ratio of total direct taxes to nominal GDP
indigdp	the ratio of total indirect taxes to nominal GDP
dindgdp	the first difference of the ratio of total indirect taxes to nominal GDP
npubemp	the number of persons employed in the public sector (comprising of the central govts.+ state govts. + quasi central and state govts + local bodies)
dnpubemp	the first difference of the number of persons employed in the public sector

**Table 3: Results from Unit Root Tests (Augmented Dickey- Fuller Tests)**

<b>Variables</b>	<b>Test-Statistics</b>	<b>Selected Lag-length</b>
Ln(Realgdp)	-0.290	4
Grgdp	-5.181	3
CashM3	-2.035	1
DcashM3	-4.298	0
LN(Rcurr)	-2.238	1
Dcurr	-1681.543	0
Ln(CPI)	-0.335	4
Inflation	-6.194	3
Corgdp	-2.856	0
Dirtgdp	-4.199	3
Indgdp	-2.228	0
Dindgdp	-5.389	0
Npubemp	1.594	0
Dnpubemp	-4.177	1

**Table 4: MIMIC MODEL RESULTS and the PARAMETER ESTIMATES**

	<b>MODEL 1</b>	<b>MODEL 2</b>	<b>MODEL3</b>	<b>MODEL4</b>
<i>Indicators</i>				
Grgdp	0.41 (1.70)	0.39 (0.96)	0.42 (1.67)	0.63 (1.09)
dcashm3		1.00		1.00
Dcurr	1.00		1.00	
<i>Causes</i>				
Inflation	-0.64 (-5.06)	0.06 (0.41)	-0.63 (-4.81)	0.04 (0.28)
Corgdp	0.18 (1.43)	0.26 (1.66)		
Dirtgdp			-0.06 (-0.45)	0.01 (0.06)
dnpubemp	-0.23 (-1.75)	-0.26 (-1.56)	-0.29 (-2.22)	-0.32 (-1.93)
Dindgdp	-0.01 (-0.09)	0.02 (0.11)	0.00 (0.00)	0.03 (0.19)

**Table 5: Diagnostic Statistics of the Estimated MIMIC Model**

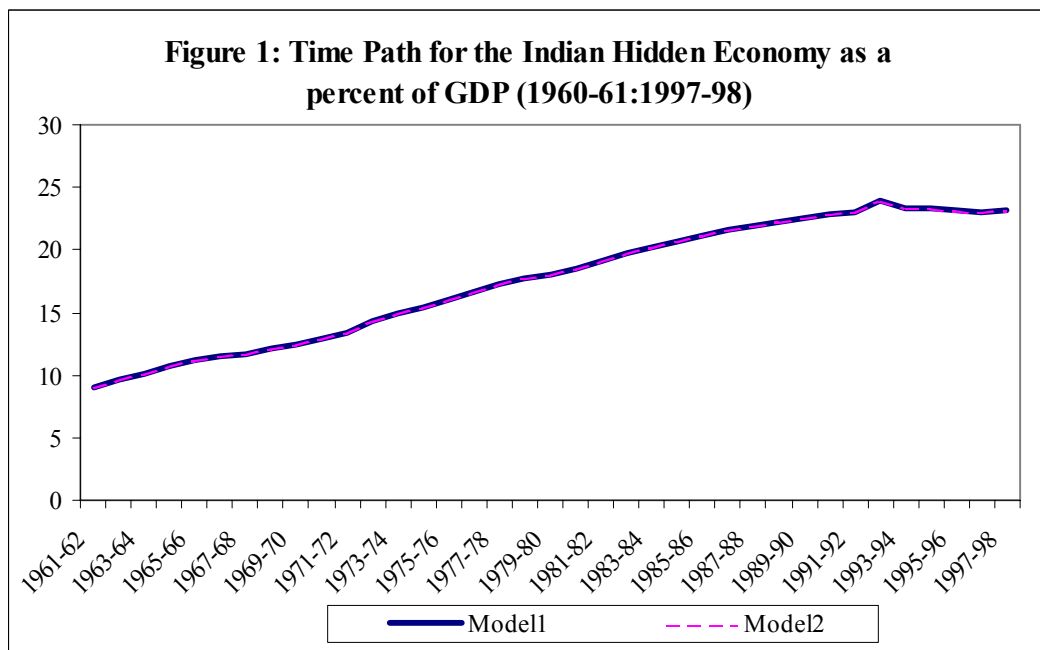
	<b>MODEL1</b>	<b>MODEL 2</b>	<b>MODEL3</b>	<b>MODEL4</b>
Chi-Square	0.74	3.03	0.73	2.92
[p-value]	0.86	0.39	0.87	0.40
RMSEA	0.0	0.0	0.0	0.0
P-Value for Test of Close Fit (RMSEA < 0.05)	0.88	0.45	0.88	0.46
RMR (Root mean square residual)	0.03	0.06	0.03	0.06
Adjusted Goodness of Fit (AGFI)	0.95	0.82	0.95	0.82
PGFI (Parsimony Goodness of Fit)	0.14	0.14	0.14	0.14

**Table 6: Size of the Hidden Economy for India as a percent of Measured GDP (1960-61: 1997-98)**

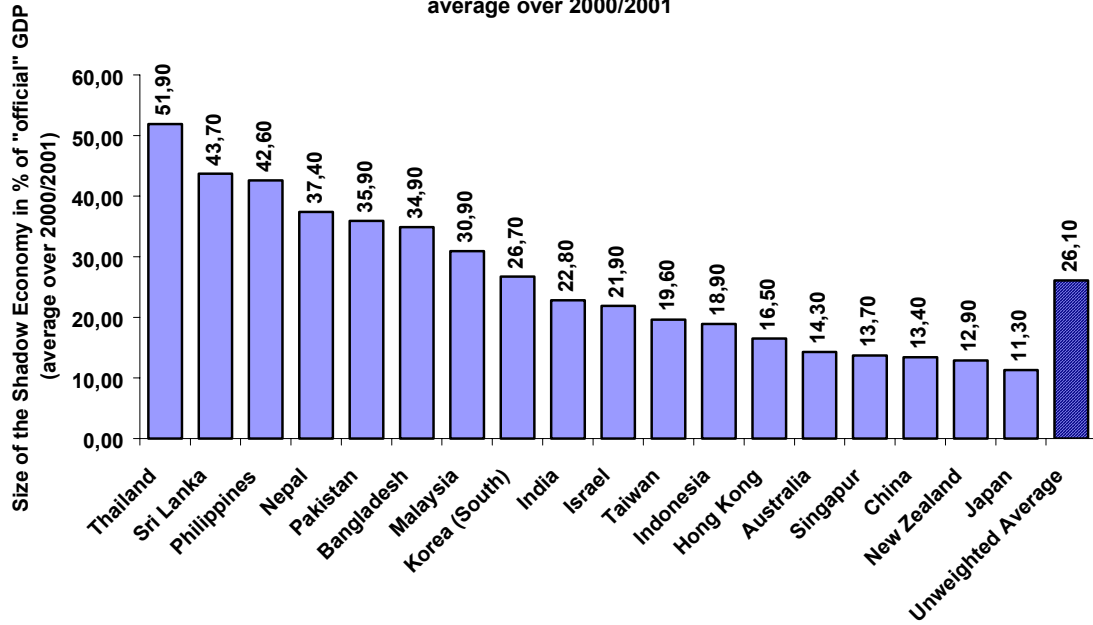
<b>YEAR</b>	<b>SIZE (ESTIMATED USING MODEL 2)</b>
1961-62	8.99
1962-63	9.59
1963-64	10.11
1964-65	10.65
1965-66	11.20
1966-67	11.52
1967-68	11.72
1968-69	12.09
1969-70	12.47
1970-71	12.83
1971-72	13.40
1972-73	14.32
1973-74	14.93
1974-75	15.39
1975-76	15.98
1976-77	16.59
1977-78	17.27
1978-79	17.65
1979-80	18.03
1980-81	18.52
1981-82	19.07
1982-83	19.68
1983-84	20.17
1984-85	20.65
1985-86	21.14
1986-87	21.55
1987-88	21.91
1988-89	22.20
1989-90	22.50
1990-91	22.79
1991-92	22.97
1992-93	23.86
1993-94	23.25
1994-95	23.28
1995-96	23.21
1996-97	23.01
1997-98	23.19

**Table 7: Regression results for the Change in the Size of the Hidden Economy**

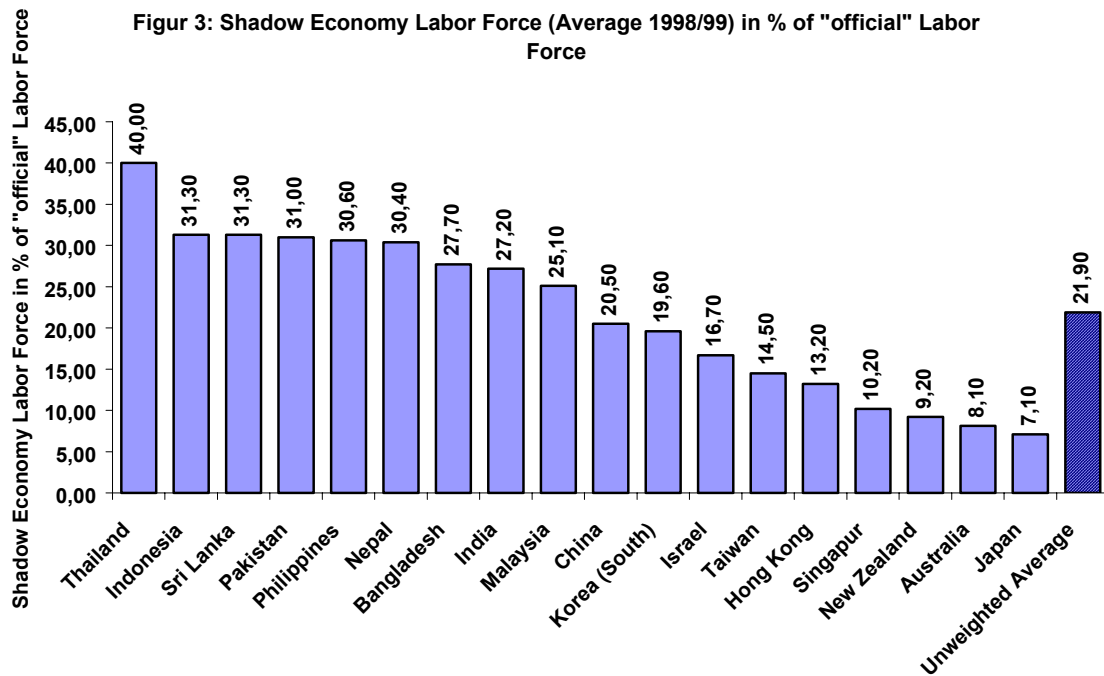
	MODEL 1		MODEL 2		MODEL 3		MODEL 4	
circpc	-6.455 (-1.612)		-6.462 (-1.613)		-6.457 (-1.612)		-6.461 (-1.613)	
circpc(1)		-7.562 (-1.677)		-7.570 (-1.668)		-7.564 (-1.667)		-7.570 (-1.668)
coaliti	-0.147 (-0.774)	-0.168 (-0.927)	-0.147 (-0.774)	-0.168 (-0.928)	-0.147 (-0.774)	-0.168 (-0.927)	-0.147 (-0.774)	-0.168 (-0.928)
election	-0.031 (-0.453)	-0.036 (-0.514)	-0.031 (-0.452)	-0.036 (-0.514)	-0.031 (-0.453)	-0.036 (-0.514)	-0.031 (-0.452)	-0.036 (-0.514)
R <sup>2</sup>	0.194	0.203	0.194	0.203	0.194	0.203	0.194	0.203
DW statistic	1.784	1.722	1.784	1.722	1.784	1.722	1.784	1.722



Figur 2: Size of the Shadow Economy (in % of "official" GDP) in Asian Countries, average over 2000/2001



Figur 3: Shadow Economy Labor Force (Average 1998/99) in % of "official" Labor Force



**Table 8: The Size of the Shadow Economy and of the Shadow Economy Labor Force of 18 Asian Countries**

Country	Size of the Shadow Economy (in % of “official”GDP)			Shadow Economy Labor Force (Average 1998/99)		
	Average 1989/90	Average 1994/95	Average 2000/2001	Persons (millions)	in % of “official” Labor Force	in % of Population
1 Australia	10.1	13.5	14.3	0.81	8.1	4.3
2 Bangladesh	26.2	30.2	34.9	17.72	27.7	14.1
3 China	-	10.2	13.4	152.43	20.5	12.3
4 Hong Kong	13.0	15.3	16.5	0.46	13.2	8.1
5 India	18.1	20.3	22.8	117.23	27.2	11.9
6 Indonesia	10.4	15.4	18.9	30.74	31.3	15.1
7 Israel	14.3	17.1	21.9	0.51	16.7	8.2
8 Japan	8.8	10.6	11.3	4.76	7.1	3.8
9 Korea (South)	19.4	22.4	26.7	4.51	19.6	9.7
10 Malaysia	26.4	28.3	30.9	2.25	25.1	10.1
11 Nepal	32.6	33.4	37.4	3.34	30.4	14.4
12 New Zealand	9.2	11.3	12.9	0.18	9.2	4.7
13 Pakistan	28.2	31.4	35.9	15.23	31.0	11.6
14 Philippines	34.2	38.4	42.6	9.82	30.6	13.0
15 Singapore	9.4	11.2	13.7	0.21	10.2	6.3
16 Sri Lanka	30.4	35.3	43.7	2.54	31.3	13.3
17 Taiwan	15.3	17.4	19.6	1.95	14.5	8.7
18 Thailand	44.2	48.3	51.9	14.83	40.0	20.1
<b>(Unweighted) Average of the 18 Countries</b>	<b>20.6</b>	<b>22.8</b>	<b>26.1</b>	<b>21.14</b>	<b>21.9</b>	<b>10.5</b>

Source: Own calculations.

## 8. Data Appendix:

Data on India's currency, M3, growth rate of real GDP, population, CPI, and inflation variables have been compiled from various volumes of the *Handbook of Statistics on the Indian Economy*, published annually by the Reserve bank of India. The data of the tax variables used as causal factors in the empirical MIMIC analysis, has been obtained from several issues of the *Indian Public Finance Statistics*, Ministry of Finance, Department of Economic Affairs, Government of India. The data on the number of public employees has been collected from some volumes of the publication *Statistical Abstract* of the Government of India. Data on India's total newspaper circulation was obtained from *Press in India*, published by the Registrar of Newspapers on behalf of the Ministry of Information and Broadcasting, Government of India. The political variables have been arranged and compiled from a wide range of sources. India's election and the data on coalition have been constructed with the help of information on elections from the book *India Decides*<sup>12</sup> and from Election Commission of India.

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