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disclosure of government information in  
Japan.**

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# Public policy, trust and growth: disclosure of government information in Japan.

**Abstract.** Since the end of the 1990s, local governments in Japan have enacted Information Disclosure Ordinances, which require the disclosure of official government information. This paper uses Japanese prefecture-level data for the period 1998–2004 to examine how this enactment affected economic growth. Furthermore, this paper explores how generalized trust is associated with the effect of information disclosure on economic growth. The Dynamic Panel model is used to control for unobserved prefecture specific effects and endogenous bias. The major findings are: (1) disclosure of government information has a positive effect on GDP growth; and (2) generalized trust enhances this effect on GDP growth. This implies that social trust has a critical influence on the effectiveness of policy.

**Keywords:** Information disclosure; Local government; Trust; Growth

**JEL classification:** D73; D78; H79; Z13

## 1. Introduction

It is well known that information asymmetry hampers the functioning of markets, resulting in market failure. Hence, government plays an important role in preventing market failure by, for instance, provision of public goods. Ideally, the government is required to act as a 'benevolent dictator' to maximize social welfare. However, because of information asymmetry between government and citizens, it is difficult for citizens to evaluate and criticize the effectiveness of the government's activities. This leads politicians and bureaucrats to behave in a way that maximizes self-interest. It is widely acknowledged that bureaucrats in the government sector have an incentive to maximize their budget (Niskanen, 1971), and that the absence of profit incentives induces government organizations to be less efficient (Buchanan & Wagner, 1977). Consequently, the government has a detrimental effect on economic growth. Assuming citizens can obtain sufficient information about the government's activities, citizens are able to criticize the government if it is inefficient. Inevitably, the government is forced to be efficient to maximize social welfare, resulting in economic growth. Recently, local governments in Japan have enacted Information Disclosure Ordinances (IDOs), which require the disclosure of official information to ensure accountability (Jiyukokuminsha, 2009). These ordinances enable citizens to obtain information about government activities, reducing the information asymmetry between local government and citizens. Therefore, ordinance enactment is expected to accelerate economic growth. If so, enactment is important from the view point not only of democracy but also of economic efficiency. One of the purposes of this paper is to examine empirically the effect of IDOs on GDP growth.

Social values related to corruption, norms, or social trust appear to have been shaped by traditional culture or religion (Gokcekus, 2008). Recently, researchers have begun to shed light on the social values which seem to affect economic efficiency (see, for example, Stutzer and Lalive, 2004; Arruñada, 2010; Schaltegger and Torgler, 2010). Social trust is one of the key concepts in the field of social science (Uslaner, 2002)<sup>1</sup>. Since the seminal work of Knack and Keefer (1997), a number of articles investigating the relationship between social trust and economic growth suggest that social trust is positively related to economic growth (e.g., Whiteley, 2000; Zak and Knack, 2001; Beugelsdijk et al., 2004)<sup>2</sup>. There are various channels through which social trust appears to affect economic growth. Bjørnskov (2010) suggested that social trust has a positive effect on schooling and rule of law, and in turn accelerates the investment rate or the growth rate<sup>3</sup>. Pre-existing mutual trust among citizens leads the welfare state to function well (Bergh and Bjørnskov, 2009). Interaction between trust, thought of as an individual behavior, and policy seems to be important to increase the

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<sup>1</sup> Social trust is one of feature of social capital (Putnam, 1993; 2000).

<sup>2</sup> Contrary to previous work, Berggren et al. (2008) presented evidence that when outliers are removed, the trust-growth relationship is no longer robust.

<sup>3</sup> Existing work found that social trust makes a contribution to human capital formation (Bjørnskov, 2009; Papagapitos and Riley, 2009).

effectiveness of public policy<sup>4</sup>. Hence, this paper explores not only the effect of disclosure of government information on growth but also whether the level of trust accelerates the effect. There seems to be, however, a reverse causality between disclosure of information and growth, and also between trust and growth. This results in endogeneity bias, which we aim to avoid in this paper by using the Arellano-Bond type Dynamic Panel model.

The remainder of this paper is organized as follows. Disclosure of official local government information is briefly reviewed in Section 2. Section 3 explains the data and methods used. Section 4 discusses the results of the estimations. The final section offers concluding observations.

## 2. Review of disclosure of local government information in Japan

### 2.1. The Information Disclosure Act

The disclosure of official information is thought to play an important role in ensuring government accountability, and is therefore promoted by local governments in Japan. Since the late 1990s, the number of local governments enacting IDOs increased significantly (Jiyukokuminsha, 2009). These ordinances guarantee citizens the right to any information that the municipality has. Once the ordinance is enacted, a municipality has an obligation to disclose information when a citizen requests it. For instance, citizens can access information about the process to appoint the supplier of public services. Hence, citizens are able to keep a close eye on collusion between politicians, bureaucrats and private companies.

Municipalities are the lowest level of local government. A cursory examination of Figure 1 reveals that the rate at which municipalities enacted IDOs rose rapidly. In 1998, the rate was about 0.22, but reached 0.92 by 2004. This indicates that this period saw a drastic change leading to government information becoming more accessible to citizens. This change is expected to deter politicians and bureaucrats from behaving for self-interest.

In 2004, there were 3123 municipalities in Japan's 47 prefectures, an average of about 66 per prefecture. Since 2005, the consolidation of municipalities has proceeded with some speed; resulting in the number of municipalities decreasing to 2333 in 2005 and then to 1795 in 2009<sup>5</sup>. At the same time, the rate of municipalities enacting IDOs rose from 0.97 in 2005 to 0.99 in 2009<sup>6</sup>. Annexation of

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<sup>4</sup> According to the argument of Algan and Cahuc (2009), the Danish policy on the labor market is characterized by unemployment insurance which leads to low unemployment rates. However, such a policy is thought to raise a moral hazard that is more difficult to overcome under conditions in which individuals are more likely to cheat. Hence, the provision of unemployment insurance is more costly in countries where social values are tolerant about cheating on unemployment, resulting in ineffectiveness of unemployment insurance policy.

<sup>5</sup> Between 1998 and 2004, number of municipalities decreased slightly from 3255 to 3123.

<sup>6</sup> Data for 2005 is available at

[http://warp.ndl.go.jp/info:ndljp/pid/283520/www.soumu.go.jp/s-news/2005/050729\\_3.html](http://warp.ndl.go.jp/info:ndljp/pid/283520/www.soumu.go.jp/s-news/2005/050729_3.html) (accessed November 28, 2010).

Data for 2009 is available at

[http://www.soumu.go.jp/menu\\_news/s-news/16773.html](http://www.soumu.go.jp/menu_news/s-news/16773.html) (accessed November 28, 2010).

municipalities is thought to be positively correlated with the rate of IDO enactment. That is, the rate of enactment of IDOs reflects to some degree the annexation of municipalities. Furthermore, from 2005 to 2009, the change in the rate of enactment is negligible. Therefore, we restrict ourselves to the period 1998-2004.

## 2.2. Testable hypotheses.

The supply of public goods is determined through a political process, and hence differs from the optimum level of supply in terms of economics. Bureaucrats in the government sector have a strong incentive to expand the organization for the sake of their powers and positions, which is why bureaucrats endeavor to maximize their budget (Niskanen, 1971). Because of the scarcity of incentives for maximizing social welfare, government organizations become less efficient than a 'benevolent dictator' (Buchanan & Wagner, 1977). As a consequence, a government tends to supply unnecessary public goods. However, the cost for the supply of public goods is financed through taxation. Citizens are thus expected to criticize government policy when the cost of public goods outweighs their benefit. Nevertheless, a government has abundant information about government activities, which is often difficult for citizens to obtain. Because of this information asymmetry, "government can easily manipulate information to inflate the value of the public goods they want to supply" (Hayami, 2001, p.227).

IDOs reduce the cost of collecting information about government activities, and the enactment of IDOs seems to have reduced the information asymmetry between government and citizens. Hence, citizens know how public spending is used and the extent to which it benefits them. Once citizens can access to the information, they are then able to criticize policies as being for the self-interest of the politicians and bureaucrats. Consequently, budget allocations become more efficient, resulting in economic growth. These considerations lead us to advance Hypothesis 1:

*Hypothesis 1: Government information disclosure accelerates economic growth.*

Even when an IDO is enacted, its impact depends on the attitude of citizens toward political participation. Social trust is positively associated with the overall quality of governance (Helliwell and Putnam, 1995). More precisely, social trust enhances participation in the political process and in turn improves the quality of government (Knack, 1992). Therefore, the effectiveness of information disclosure is reinforced by trust. That is, disclosure of information is less likely to enhance growth if there is lower level of trust. Possible outcomes of disclosure of information vary according to social values such as the level of trust among citizens. Hence, we also make the following hypothesis.

*Hypothesis 2: Social trust enhances the effects of government information disclosure on economic growth.*

### 3. Data and method

#### 3.1. Data

Table 1 gives the definitions of the variables used in this paper, along with the means and standard deviations for the data used. This paper uses panel data at the prefecture level<sup>7</sup>. The structure of the data consists of 47 prefectures for the period 1998-2004. GDP per capita comes from Asahi Shimbun (2008). Population, political group members per head of population and the rate of IDO enactment are derived from Index Publishing (2006). The unemployment rate is available from the website of the Statistics Bureau of the Ministry of Internal Affairs and Communications<sup>8</sup>. The Population Census (1990, 2000), as published by the Ministry of Internal Affairs and Communications, provided data for to the number of people who graduated from university. The data between 1998 and 2000 were generated by interpolation based on the assumption of constantly changing rates between 1990 and 2000. The data between 2001 and 2004 were calculated by adding the annual number who graduated from university between 2001 and 2004, collected from the Basic Report for Schools (2001-2004) published by the Ministry of Education, Culture, Sports, Science and Technology.

This paper uses the Japanese General Social Surveys (JGSS) data for constructing the proxy variable of prefecture-level generalized trust. The JGSS surveys were conducted throughout Japan during 2000-2003<sup>9</sup> using a two-step stratified sampling method, and were designed to be the Japanese counterpart of the General Social Survey in the United States. This survey, conducted through face-to-face interviews, included questions about individual characteristics such as generalized trust and prefecture of residence. The survey collected data from 12,299 adults, aged between 20 and 89 years. With respect to generalized trust, considered to be a crucial independent variable, respondents were all asked: "Generally speaking, would you say that most people can be trusted?" The possible responses to this question were "no", "depends", and "yes". The proportion of respondents who chose "yes" in each prefecture is used as a proxy variable for social trust in this paper.

#### 3.2. Methods

To examine the hypotheses raised previously, this paper uses the Arellano-Bond type Dynamic

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<sup>7</sup> A Japanese prefecture is roughly equivalent to a state in the United States or a province in Canada.

<sup>8</sup> It is available from <http://www.stat.go.jp/data/roudou/pref/index.htm>. (accessed November 1, 2010).

<sup>9</sup> JGSS are designed and carried out at the Institute of Regional Studies at Osaka University of Commerce in collaboration with the Institute of Social Science at the University of Tokyo under the direction of Ichiro TANIOKA, Michio NITTA, Hiroki SATO and Noriko IWAI with Project Manager, Minae OSAWA. The project was assisted financially by a Gakujutsu Frontier Grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology for the 2000-2003 academic years, and the datasets were compiled and distributed by SSJ Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo.

Panel model (Arellano, 2003). The estimated function takes the following form:

$$\begin{aligned} \ln(GDP)_{it} = & \alpha_1 \ln(GDP)_{i(t-1)} + \alpha_2 DINF_{it} + \alpha_3 DINF_{it} * TRUS_i + \alpha_4 GROUP_t + \alpha_5 UNEMP_{it} + \alpha_6 EDU_{it} \\ & + \alpha_7 \ln(POP)_{it} + u_i + \varepsilon_{it}, \end{aligned} \quad (1)$$

where the dependent variable is  $\ln(GDP)_{it}$  in prefecture  $i$ , for year  $t$ , and the  $\alpha$ s represent regression parameters. The lag in the dependent variable is included as an independent variable.  $u_i$  represents the unobservable fixed effects of prefecture  $i$  and  $\varepsilon_{it}$  is the error term. The proxy for generalized trust,  $TRUS_i$ , is a time-invariant variable. Hence,  $TRUS_i$  is captured by  $u_i$  and so is removed from both the Fixed Effects and Dynamic Panel models. However, the interaction term  $DINF_{it} * TRUS_i$  is retained because  $DINF_{it}$  is not time-invariant. The structure of the data covers 6 years for 47 prefectures. However, the Dynamic Panel model takes the first difference and  $\ln(GDP)$  lagged two periods or more are used as instruments, so 47 observations for two years are discarded. Dummy years are included to capture macroeconomic factors. To eliminate  $u_i$  from the model, we take the first difference form as follows:

$$\begin{aligned} \ln(GDP)_{it} - \ln(GDP)_{i(t-1)} = & \alpha_1 (\ln(GDP)_{i(t-1)} - \ln(GDP)_{i(t-2)}) + \alpha_2 (DINF_{it} - DINF_{i(t-1)}) \\ & + \alpha_3 (DINF_{it} * TRUS_i - DINF_{i(t-1)} * TRUS_i) + \alpha_4 (GROUP_{it} - GROUP_{i(t-1)}) + \alpha_5 (UNEMP_{it} - UNEMP_{i(t-1)}) + \\ & \alpha_6 (EDU_{it} - EDU_{i(t-1)}) + \alpha_7 (\ln(POP)_{it} - \ln(POP)_{i(t-1)}) + \varepsilon_{it} - \varepsilon_{i(t-1)}. \end{aligned} \quad (2)$$

The dependent variable can be considered to be the growth rate of per capita GDP. Income is considered to influence the utility of citizens and so low economic growth leads citizens to criticize local government policy. Consequently, citizens require the government to disclose official information. This is why economic growth affects local governments' decisions to enact IDOs. The  $DINF$  and  $DINF*TRUS$  terms are treated as endogenous variables in the Dynamic Panel model for the purpose of controlling for the estimation bias<sup>10</sup>. We use endogenous variables lagged two-periods or more as additional instrumental variables (Arellano, 2003, p.168).

$\alpha_2$  can be interpreted as the effect of  $DINF$  change on per capita GDP. From Hypothesis 1, we anticipate that  $\alpha_2$  will be positive. The interaction term  $DINF*TRUS$  is incorporated to examine whether social trust affects the disclosure of government information. Hypothesis 2 leads us to expect  $\alpha_3$  to be positive. As for control variables, Olson (1982) emphasized that special interest groups have a propensity to lobby for preferential policies, imposing disproportionate costs on the rest of society. This effect is captured by the  $GROUP$  variable. Unemployment is considered to be inefficient labor allocation, and hence has a detrimental effect on growth. Therefore,  $GROUP$  and  $UNEMP$  are expected to have negative values. Human capital accumulation is thought to play a positive role on economic growth, and therefore the predicted sign of  $EDU$  is positive.

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<sup>10</sup> Bali moune-Lutz (2009) used the Dynamic Panel model to control for endogenous bias by treating several independent variables as endogenous. In Bali moune-Lutz (2009), the dependent variable is literacy rate while the endogenous independent variables include a proxy for institutional quality and an interaction term between institutional quality and a proxy for ethnic tension.

## 4. Results

Table 2 shows the results of the OLS and the Fixed Effects estimations. In Table 2, results of OLS estimation are shown in columns (1) and (2), while those from the Fixed Effects model are in columns (3) and (4). Table 3 gives the results of the Dynamic Panel estimation where, as explained in the previous section,  $DINF$  and  $DINF*TRUS$  are treated as endogenous variables. The unemployment rate is affected by the economic growth because high growth leads to reduction of unemployment. In addition to  $DINF$ ,  $UNEMP$  is treated as an endogenous variable and its values are presented in columns (2) and (4) of Table 3.

We can see from Table 2 that  $DINF$  is positive in all of the estimations.  $DINF$  is statistically significant in the Fixed Effects estimation, but not statistically significant in the OLS estimation. This implies that the unobserved fixed effects in each prefecture have an influence and so their omission from the model causes the results to suffer from bias. Contrary to expectation,  $DINF*TRUS$  is negative, despite being statistically insignificant.  $UNEMP$  is negative as anticipated and is statistically significant in OLS estimation, but is not statistically significant in the Fixed Effects estimation.

Turning to the results in Table 3, we check the validity of the Dynamic Panel estimation before discussing the results for each variable. The two important tests are Sargan's over-identification test and the second-order serial correlation test (Arellano, 2003). We present Sargan's test to check the validity of the instrumental variables. The null hypothesis is that the instrumental variables are uncorrelated to the residual. If the hypothesis is not rejected, the instruments are valid. Furthermore, confirming the null hypothesis that there is no second-order serial correlation for the disturbance of the first-difference equation is important because the consistency of the estimator relies upon the absence of second-order serial correlation. Table 3 tells us that both hypotheses are not rejected for all estimations, suggesting that the estimation results are valid.

$DINF$  is positive as anticipated, and is statistically significant in columns (1) and (2). As shown in columns (3) and (4), when the interaction term  $DINF*TRUS$  is incorporated it is positive and statistically significant. That is, generalized trust complements the disclosure of government information. From this, we argue that the effectiveness of a government's policy is affected by the degree of trust among citizens. We note that the results are obtained after controlling for unobserved fixed effects, macro factors and endogenous bias, and interpret Table 3 as implying that disclosure of government information has a positive effect on GDP growth and that generalized trust enhances the positive effect of information disclosure. The combined results of Tables 2 and 3 support both Hypothesis 1 and Hypothesis 2.

## 5. Conclusion

As is generally acknowledged, asymmetric information is a cause not only of market failure but also of government failure, resulting in reduced social welfare. From the viewpoint of economics,



politician and bureaucrat are considered as the agent, while citizens are regarded as the principal. Information asymmetry between agent and principal induces the agent to act inappropriately from the viewpoint of the principal. That is, because of information asymmetry, moral hazards occur and result in economic inefficiency. Therefore policies to reduce information asymmetry are required, and a key purpose of this paper is therefore to investigate the effectiveness of such policies. On the other hand, researchers have recently shed new light on the role of social values such as trust on outcomes and effectiveness of policy decisions. However, this subject remains open to further work.

Another purpose of this paper is to ascertain the association between trust and the effectiveness of the policy. Since the end of the 1990s, local governments in Japan have enacted IDOs. This paper uses Japanese prefecture-level data for the period 1998–2004 to examine how the enactment of IDOs affect economic growth. Furthermore, this paper explores how generalized trust is associated with the effect of information disclosure on economic growth. The Dynamic Panel model is used to control for unobserved prefecture specific effects and endogenous bias. The major findings are: (1) disclosure of government information has a positive effect on GDP growth; and (2) generalized trust enhances this effect on GDP growth. This implies that social trust has a critical influence on the effectiveness of policy.

The findings above lead us to argue that the interaction between public policy and the degree of trust should be taken into account when the outcome of a policy is being considered. Outcomes of a policy vary according not only to economic conditions, but also to social values such as trust (Algan and Cahuc, 2009). Furthermore, policy design requires more than simply employing a policy expected to be effective under the traditionally given culture and value system. Policy makers should continually endeavor to change the perception of the citizens to ensure an economically efficient market that is acceptable to them.

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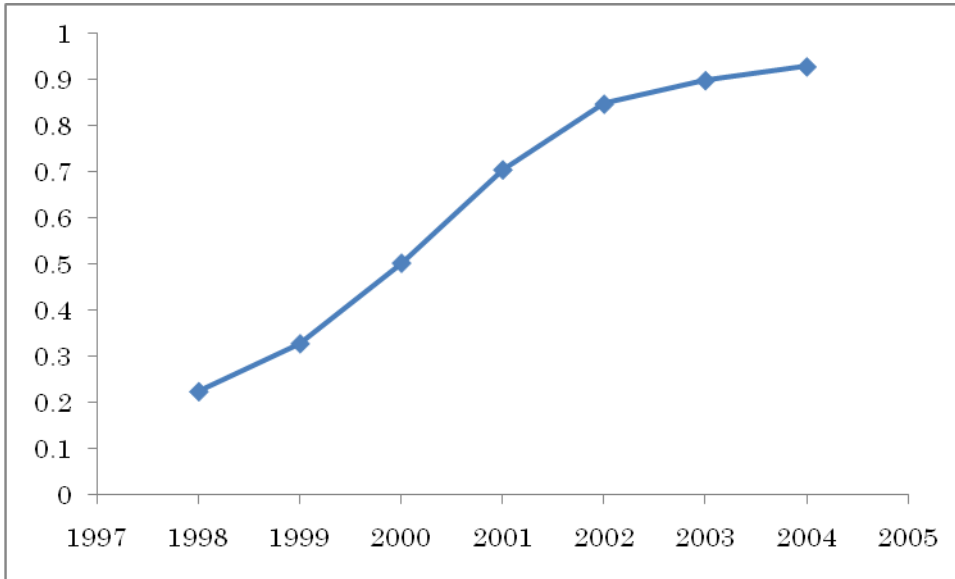


Fig.1. Rates of enactment of Information Disclosure Ordinances by municipalities.

Table 1. Variable definitions and basic statistics.

Variables	Definition	(1) All	(2) Standard deviation
GDP	Per capita income. (Millions yen)	3.57	0.70
DINF	Rates of enactment of Information Disclosure Ordinances (IDOs) by municipalities (municipalities enacting IDOs/All municipalities)	0.63	0.32
TRUS	Rate of respondents who chose “Yes”	11.9	2.70
GROUP	Political group members per population (Members of political group) / population	0.54	0.49
UNEMP	Unemployment rate	0.04	0.01
EDU	Rate of university graduation	0.20	0.03
POP	Population (Millions)	2.68	2.47

*Note.* Values are simple averages. Data source is the Japan Broadcasting Corporation (1979; 1996), Asahi Shimbun (2004), Index Publishing (2006) and the Statistics Bureau of the Ministry of Internal Affairs and Communications (various years).

Table 2. Dependent variable is  $\ln(\text{GDP})_t$  : (OLS and the Fixed Effects model)

	(1)	(2)	(3)	(4)
	OLS	OLS	FIXED	FIXED
$\ln(\text{GDP})_{t-1}$	0.96*** (83.8)	0.96*** (83.6)	0.51*** (9.12)	0.51*** (9.12)
$\text{DINF}_t$	0.008 (1.27)	0.01 (1.29)	0.02*** (2.90)	0.06** (2.52)
$\text{DINF}_t * \text{TRUS}$		-0.02 (-0.63)		-0.16 (-1.47)
$\text{GROUP}_t$	4.65* (1.83)	4.65* (1.83)	18.8 (1.23)	20.2 (1.31)
$\text{UNEMP}_t$	-0.34** (-2.26)	-0.36** (-2.34)	-0.19 (-0.45)	-0.21 (-0.50)
$\text{EDU}_t$	0.05 (1.06)	0.05 (1.03)	0.65* (1.76)	0.67* (1.82)
$\ln(\text{POP})_t$	0.001 (0.66)	0.002 (0.82)	-0.06 (-0.47)	-0.06 (-0.48)
Constant	-0.14* (-2.16)	-0.15* (-2.23)		
Dummy year	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.98	0.98	0.52	0.53
Observations	281	281	281	281

Notes: Numbers in parentheses are t-statistics. \*, \*\*, and \*\*\* indicate significance at 10, 5, and 1 per cent levels, respectively. 'Yes' means that dummy years are included as independent variables.

Table 3. Dependent variable is  $\text{Ln}(\text{GDP})_t$ : (Dynamic Panel Model)

	(1)	(2)	(4)	(5)
$\text{Ln}(\text{GDP})_{t-1}$	0.18 (1.21)	0.21 (1.21)	0.34*** (3.04)	0.34*** (3.33)
$\text{DINF}_t$	0.02* (1.93)	0.02* (1.77)	-0.04 (-1.23)	-0.04 (-1.08)
$\text{DINF}_t * \text{TRUS}$			0.32* (1.88)	0.28* (1.73)
$\text{GROUP}_t$	3.04 (0.18)	7.39 (0.44)	3.66 (0.20)	6.32 (0.36)
$\text{UNEMP}_t$	0.35 (0.76)	0.23 (0.51)	0.40 (0.82)	0.23 (0.50)
$\text{EDU}_t$	0.37 (0.93)	0.27 (0.70)	0.48 (1.15)	0.37 (0.92)
$\text{Ln}(\text{POP})_t$	-0.003 (-0.02)	-0.13 (-0.91)	0.04 (0.24)	-0.04 (-0.32)
Dummy years	Yes	Yes	Yes	Yes
Endogenous variables	DINF	DINF UNEMP	DINF DINF*TRUS	DISCINF DINF*TRUS UNEMP
Sargan-test <P-value>	17.8 <0.92>	35.0 <0.80>	35.7 <0.73>	48.3 <0.78>
Serial correlation Second order <P-value>	-1.56 <0.11>	-1.40 <0.16>	-1.20 <0.22>	-1.17 <0.23>
Observations	233	233	233	233

Notes: Numbers in parentheses are z-statistics. \*, \*\*, and \*\*\* indicate significance at 10, 5, and 1 per cent levels, respectively. 'Yes' means that dummy years are included as independent variables.