



Formal and informal deterrents of crime in Japan: Roles of police and social capital revisited

Eiji Yamamura

Seinan Gakuin University, Department of Economics, 6-2-92 Sawaraku Nishijin, Fukuoka 814-8511, Japan

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ABSTRACT

Using Japanese prefecture-level panel data, this paper examines how the crime rate is affected by formal and informal deterrents as reflected by police and social capital, respectively. Both, however, suffer from the endogeneity problem and therefore the estimation results are biased when regression analysis is conducted. Hence, the fixed effects 2SLS method is employed to control for the endogeneity bias as well as for unobservable fixed effects. As well, the relationship between inequality and crime is examined. The main findings are: (1) police and social capital reduce the crime rate and their effects increase when the endogeneity bias is controlled for through fixed effects 2SLS estimation. (2) The effects of social capital, which is smaller than that of police, is however reinforced by police through the complementary relationship existing between them.

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1. Introduction

Since the seminal work of Becker (1968) provided the first theory of crime based upon rational behavior, many works have been devoted to the study of the economics of criminal behavior (e.g., Ehrlich, 1973; Fajnzylber et al., 2002a; Glaeser and Sacerdote, 1999; Levitt, 1997; Carneiro et al., 2005). The central tenet of Becker's theory is that crime will decline if police presence rises. This prediction, however, is not consistent with the findings of the ensuing empirical studies that tested it (e.g., Cameron, 1988; Eck and Maguire, 2000). As recent works point out, failing to find empirical support of Becker's prediction is in large part due to a serious endogeneity problem stemming from simultaneous determination of crime and police presence (Levitt, 1997; Di Tella and Schargrodsky, 2004; Kelly, 2000). Hence, researchers are essentially required to control for this endogeneity problem to present unbiased estimation results.

The influence of the attitude and conduct of others on a person's behavior seems apparent among neighbors and colleagues in schools and workplaces, and such interactive mechanism above also applies to a criminal behavior (Funk, 2005a,b; Glaeser et al., 1996). The cost of committing a crime is not only attributable to formal sanctions applied by police but also informal sanctions such as stigma probably reinforced by a strongly bonded community

(Funk, 2005b; Rasmusen, 1996). That is, borrowing an expression of Coleman (1990, p. 557), "the external sanctions by which persons' actions are made responsible range from informal ones, such as expressions of ostracism, to legal sanctions for breaking laws or regulations". Social science researchers have shed new light on social capital (e.g., Coleman, 1990; Putnam, 1993), thereby provoking discussions concerning economic development and growth (e.g., Bloch et al., 2007; Guiso et al., 2004; Hall and Jones, 1999; Knack and Keefer, 1997). Social capital appears to play a critical role in economic development through various channels such as deterring criminal behavior; however, surprisingly few attempts have so far been made to investigate the association between crime and social capital. Lederman et al. (2002) made the first attempt to examine the influence of social capital on the incidence of crime using cross-country data. As pointed out by Lederman et al. (2002), estimation results might suffer from an endogeneity bias when the effects of social capital on crime are examined through regression estimations. To control for this bias, they employed 2SLS estimation and, as a result finds no clear link between them. One reason is probably the omitted variable biases arising from a scarcity of data and unobservable country specific effects.^{1,2}

¹ Sample size, 25–31, is too small to make results statistically insignificant (Lederman et al., 2002).

² In the interpretation of Lederman et al. (2002), the indicators of social capital that they defined reflect both group-specific and society-wide social capital, which

E-mail address: cyl02111@nifty.com.

With the aim of not only controlling for endogeneity bias but also omitted variable bias, panel data containing various important variables such as the presence of police, inequalities, and education level should be used when employing fixed effect 2SLS estimation.

According to [Benedict \(1946\)](#), Japanese culture is characterized as a 'culture of shame' in contrast to the 'culture of sin' in the west. While the sin that Westerners feel they should avoid is identified by a person as he contrasts his deeds with the commandments of an absolute being, shame is felt by a person when his behavior is seen and gossiped about by other people. This implies that Japanese people are more likely to be affected by neighbors. The culture of shame, a feature of Japan, is relevant to the psychological cost of committing a crime through local interaction ([Funk, 2005a,b](#)). Hence, compared with the Western situation, it seems more appropriate, as well as interesting to examine the effects of social capital on crime in Japan.

In this research, I consider the police presence a formal deterrence to crime, whereas social capital is regarded as an informal deterrence.³ In the field of law and economics, the association between formal and informal agreements has already drawn much attention.⁴ Although it is essential to consider them both when factors determinant of crime are ascertained, little attention, with the exception of theoretical work of [Funk \(2005a,b\)](#), has been given to capturing them at the same time. Further, whether the relationship between formal and informal deterrents is a substitute or complementary one is profoundly relevant to this topic from the standpoint of institutional analysis ([Hayami, 2001](#); [Hayami and Aoki, 1998](#)).

The circumstance of Japan characterized by a 'culture of shame' is thought to generate more sensitive responses to informal punishment and stigma, making it interesting to examine criminal behavior in light of this.⁵ The aim of this report is to examine not only the effects of formal and informal deterrents, such as police presence and social capital, but also their cross-product effect upon criminal behavior after controlling for the endogeneity bias as well as unobservable individual fixed effects. To this end, I use the comprehensively compiled panel from 46/47 Japanese prefectures for the years 1994–2001 to conduct fixed effect 2SLS estimations.

The major findings provided through estimations conducted in this paper make it evident that police and social capital pronouncedly reduce crime, and, furthermore, that police and social capital are complementary influences reducing crime. The organization of this paper is as follows: Section 2 surveys features of Japanese society and social capital in Japan. Section 3 explores the simple relationships between crime rate and various key variables, and presents a simple econometric framework. Section 4 discusses the results of the estimations. The final section offers concluding observations.

are expected to promote and reduce crime, respectively. Therefore these opposite effects neutralize each other.

³ [Yamamura \(2008\)](#) explores effects of formal and informal deterrents on driving behavior.

⁴ Opinions of researchers vary regarding the nature of the relationship between formal law and informal norms. Some existing reports argue that social norms are a substitute for law (e.g., [Lubell and Scholz, 2001](#); [Sitkin and Roth, 1993](#); [Huang and Wu, 1994](#)). Others argue that formal law complements informal norms by facilitating self-enforcement (e.g., [Bull, 1987](#); [North, 1990](#); [Lazzarini et al., 2004](#)).

⁵ So far research on crime in Japan has failed to grasp the effect of formal and informal deterrents at the same time (e.g., [Evans, 1977](#); [Ladbrook, 1988](#); [Tsumura, 1996](#); [Finch, 2000](#)).

2. Review of characteristics in Japanese society

2.1. Data

Data I used in this paper, especially those used as independent variables, were collected from various sources. Population, expenditure for ceremonial occasions, the numbers of public baths, community centers and divorces, total sales of alcohol, quantity of alcohol consumed, and the number of universities are obtained from the [Asahi Newspaper Publishing Company \(2005\)](#). The numbers of thefts, police personnel, and fire-fighting teams are derived from [Index Publishing \(2006\)](#).⁶ The Gini coefficient is obtained from the [Statistics Bureau of the Ministry of Internal Affairs and Communications \(various years\)](#).⁷ Most of the above data is divided by population and then converted into per capita data. The structure of the data is panel, consisting of 46 prefectures and spanning 8 years (1994–2001).⁸ Hence the raw data set includes various prefecture-level data of several variables. [Table 1](#) depicts the definition for all of the variables used in the regression estimation.

2.2. Overview

2.2.1. Socio-economic characteristics of Japan

Japanese society is characterized by a tightly knitted community generating interdependent trust. As argued by [Hayami \(2001\)](#), "The psychological basis of mutual trust could further be strengthened by incorporating personal elements in business transactions, such as exchange of gifts and attendance at weddings and funerals." ([Hayami, 2001](#), p. 290).

Historical evidence of Japan during the Tokugawa Period suggests that "Criminal responsibility was not necessarily individual in that there was also group responsibility either at the family level or at other grouping levels such as the village itself or the village headman. This not only held down crime but also meant that village officials tended to deal with crime on a local level." ([Goodman, 2004](#), p. 21).⁹ That is to say, the community was responsible for the incidence of crime and at the same time played a critical role in deterring crime, suggesting informal community oriented mechanisms have a tremendous effect upon crime. Community members who commit crime might find themselves ostracized by their local community and cut off from communal assistance; thereby losing the opportunity to receive benefits. This is considered to be a cost that depended on the condition of community, as argued by [Hayami \(2001\)](#), "the cost of such social opprobrium and ostracism would be especially large in a small, closed community characterized by a high degree of information sharing through close personal interaction" ([Hayami, 2001](#), p. 290). To put it another way, the costs

⁶ Existing works use various indicators to measure crime rates, for instance, homicide ([Lederman et al., 2002](#)); homicide and robbery ([Fajnzylber et al., 2002a,b](#)); cattle theft, burglary, homicide, and crop theft ([Fafchamps and Mintin, 2006](#)). In Japan, the number of larcenies consistently accounts for over 85% of number of all crimes during the investigated period 1994–2001 in this paper. According to the 'broken window theory', an increase in minor crimes sends a signal that 'no one cares', thereby creating a circumstance inducing more severe crime to occur ([Wilson and Kelling, 1982](#); [Funk and Kugler, 2003](#)). Larcenies per population are thus considered to be the indicator of crime rates, although Larceny is thought to be a relatively minor crime.

⁷ Gini coefficient data are scarce and can only be obtained every 5 years; for example, 1994, 1999, and 2004. To construct panel data, additional Gini data were generated by interpolation based on the assumption of constant changing rates between 1994 and 1999, and 1999 and 2004.

⁸ Japan is made up of 47 prefectures. I could not obtain the per capita consumption data of all types of alcoholic drinks for Okinawa Prefecture; thus only the data for the other 46 prefectures were used.

⁹ The Tokugawa period was from 17th to 19th century.

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