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Marketization process predicts trust decline in China

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ABSTRACT

Although previous literature has revealed the predictive effect of trust on economic development, whether the level of China's market economy development predicts changes in trust across birth cohorts remains unknown. Study 1, a cross-temporal meta-analysis of 82 studies (N = 34,151), indicated that Chinese college students' scores on the Interpersonal Trust Scale (ITS) decreased significantly from 1998 to 2011, and that the decline in interpersonal trust across birth cohorts was negatively associated with and predicated by the marketization index. Study 2 found that the levels of marketization of different provinces in China were negatively associated with the levels of trust in these provinces. The present research first proposed that the marketization process in China may predict or correlate with a trend of declining trust, and then demonstrated the validity of the proposal based on both longitudinal and cross-sectional evidence.

1. Introduction

Interest in the relationship between trust and economic development has dramatically increased in disciplines such as economics, psychology, sociology, and related fields over the past two decades. It is believed that trust can promote economic growth; is the converse also true? This question has seldom been asked or answered. The present research proposed and aimed to prove that the development of the market economy in China seems to erode its base: trust.

1.1. Trust promotes economic development: an old story

A growing body of research has demonstrated that trust reduces transaction costs and promotes economic growth (e.g., Algan & Cahuc, 2010, 2013; Bjørnskov, 2006, 2012; Knack & Keefer, 1997; Zak & Knack, 2001; Zhang & Ke, 2002). For example, Knack and Keefer (1997) found that higher trust is conducive to economic growth for a sample of 29 market economies, and that a standard deviation increase in people's level of trust raises economic growth by 1.15%. In China, trust also significantly contributes to economic performance. Zhang and Ke (2002) analyzed the cross-regional data on trust in China and discovered that trust promotes the growth of the economy, the size of enterprises, the development of private enterprises, and foreign direct investments. Fukuyama (1995) argued that trust in strangers does indeed appear to constitute a decisive determinant of the development of modern large-scale enterprises. Other studies have also repeatedly proved that interpersonal trust has positive effects on economic development, social life, and personal happiness (e.g., Algan & Cahuc, 2013;

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Bjørnskov, 2006, 2012). In short, researchers have essentially agreed that trust promotes the development of a market economy.

The positive role of trust in the growth of a market economy is due to its innate mechanism for facilitating communication and trade among strangers which reduces the costs of social exchanges. According to a study by researchers at Warwick Business School in the UK, outsourcing contracts that were signed and kept based on trust rather than stringent agreements and penalties were more likely to produce trust dividends (as much as 40% of the total value of a contract) for both parties (Covey & Merrill, 2006). Thus, Covey and Merrill (2006) argued that trust is an indispensable factor, and produces economic results: when trust goes down, economic efficiency will also go down and costs will go up. This may be because high trust effectively decreases complexity in a complex world by reducing the number of options one has to consider in a given situation (Barber, 1983; Luhmann, 1979), and reduces the cost of social functioning; moreover, it also encourages interaction among strange persons and increases social capital (Fukuyama, 1995).

1.2. Marketization process predicts trust decline in China: a new hypothesis

Although many previous empirical studies (e.g., Algan & Cahuc, 2010, 2013; Bjørnskov, 2012; Knack & Keefer, 1997) have documented that trust can positively predict economic growth in different countries and regions, the converse question, whether economic growth predicts the increase of trust, has seldom been asked. In the present research, we first proposed a hypothesis of negative association between market economy growth and trust. Over the past 30 years, the Chinese economy has grown rapidly, due in large part to continuously deepened marketization reform, but rapid economic growth was accompanied by a dramatic decline in the level of trust. Specifically, Chinese college students' interpersonal trust scores decreased across birth cohorts from 82 in 1998 to 72 in 2009 on a scale with a theoretical score range from 25 to 125 (Xin & Zhou, 2012). A similar declining trust trend was also revealed in other large samples. For instance, Ma (2008) analyzed the percentages of Chinese residents answering "trust" to the "trust question" ("*In general, do you think that most people can be trusted, or can't you be too careful in dealing with people?*") in four waves of the World Values Survey. That study found that the levels of Chinese residents' trust decreased between 1990 and 2003: the "trust" percentage was 60.3%, 52.3%, 54.5%, and 46.3% in 1990, 1995, 2001, and 2003, respectively. Moreover, the results of the Asian Barometer Survey showed that the levels of Chinese mainland residents' trust decreased by 18.5% between 1990 and 2002 (Ma, 2008). In short, Chinese trust declined rather than increased along with the economic blooming of the past decades. Therefore, though much evidence exists which supports the positive role of trust in economic growth, we cannot draw any affirmative conclusions about the converse proposition based on the existing evidence. In our opinion, the marketization process in China may be an important predictor of trust decline. The present research aimed to test this point.

To analyze the relationship between trust and market economy development, we must take the time factor into account. Toward the beginning of the marketization process, the high level of social trust in China might have yielded a trust dividend and served as an important factor in promoting economic development (Zhang & Ke, 2002). During the marketization process, the mechanisms of the market encourage benefit maximization and efficiency optimization, as well as competition and the pursuit of material interests, which arouse the behavioral dynamics of each market entity to an unprecedented level (Xin & Liu, 2013). However, the social rules or norms of market, such as powerful credit management systems for individuals and enterprises, were not fully established or performed during this period, especially during the early stages of marketization; this often resulted in the exploitation of benevolence and integrity, and thus harmed interpersonal trust. Trust as well as energy and environment is the resource base of economic development, however, some defects and limitations in the marketization process produce excessive consumption of the basic resources of economic growth, including interpersonal trust. Therefore, we proposed the hypothesis that, in China, the process of marketization (especially at the imperfect stage of market rules) is accompanied by a decline in trust.

In fact, marketization was at the core of China's economic reform over the past 30 years (Fan, Wang, & Ma, 2011). From the "planned commodity economy" reform goal proposed in 1984 to the "socialist market economy" goal proposed in 1992, the resource allocation role of the market was increasing. Recently, to deepen economic reform, the goal of making the market play a more decisive role in the allocation of resources was proposed at the Third Plenary Session of the 18th Central Committee of the Communist Party of China in 2013, which was expected to push the marketization to a new height. There is no doubt that the market plays a huge role in allocating resources and improving efficiency (Fan et al., 2011), but the development of a market economy also poses the problem of cost externality, such as environmental pollution, interpersonal indifference, and the loss of credit and trust. These issues have been recognized by the Party and the central government. However, few researchers have examined the problem of psychological costs such as the decline of interpersonal trust inherent to the marketization process. Therefore, we posited that one crucial predictor of trust decline in China may be marketization. To our knowledge, no study has ever been specifically designed to investigate the predictive effect of marketization on changes in interpersonal trust levels over time. Thus, the present study aimed to address this issue.

Moreover, we should also consider the spatial factor to analyze the relationship between marketization and trust. It is well known that there are notable differences in marketization levels from region to region in China, which may bring a result that regional trust levels are different. Therefore, we predicted that the marketization levels of different provinces are negatively associated with trust levels in those provinces. Another goal of this study was to test this hypothesis using a cross-sectional correlational design.

1.3. Controversy over the influences of marketization on trust: a literature review

Although few studies have directly examined the negative relationship between a market economy or marketization and trust, some studies have examined the relationship between a market economy or marketization and variables related to trust, e.g., cooperation, donation, and self-interested behaviors. For example, Reeson and Tisdell (2010) found that the market can produce more self-interested behavior. They found that many participants were prepared to make costly voluntary contributions in the initial public goods game; however, the introduction of the market institution triggered their "market instinct", which caused them to abandon the previously expressed social preferences and become self-interested profit maximizers. Actually, trust is a kind of prosocial behavior, and is similar to the contributions in some degree. Thus, it may be a reasonable hypothesis that the market mechanism may undermine trust.

Recently, Cohn, Fehr, and Maréchal (2014) found that a significant proportion of bank employees became dishonest when their professional identity as bank employees was rendered salient, which suggests that the prevailing business culture in the banking industry acquiesces in the dishonest behavior. What is the source of the business culture? Previous studies demonstrated that this culture may be related to the experience of learning economics, especially identification with the homo economicus belief (a basic humanity hypothesis of economics, assuming human behaviors are motivated by instrumental rationality and self-interest), which can inhibit trust (Xin, Dou, & Chen, 2013; Xin & Liu, 2013). Xin et al. (2013) investigated first and third grade college students' trust, and found that economics majors showed a significant decline in trust from first to third grades, but students majoring in other humanities and social sciences did not. The decline of trust in economics majors can be explained by their learned homo economicus belief. Moreover, Xin and Liu (2013) found that participants who were required to complete two profit calculation problems (as a simulation of participating in economic or business activities) in the experimental condition exhibited lower level of trust (both for the survey of trust in others and the trust game) than those in the control condition. With the establishment and development of a market economy, people involve themselves in economic activities more frequently than ever. This in turn may change their humanity values and make them adopt a stronger homo economicus belief, and thus may inhibit their trust in others.

Although the destructive effect of marketization or the homo economicus belief on trust has been implied or demonstrated in the studies cited above (e.g., Cohn et al., 2014; Reeson & Tisdell, 2010; Xin & Liu, 2013; Xin et al., 2013), there are some opposing views on the relationship between marketization and trust. Henrich et al.'s (2001, 2010) study of small-scale societies suggested that exposure to markets increases the strength of other-regarding preferences yet has little effect on cooperation. However, Herrmann, Thöni, and Gächter (2008) found that cooperation is enhanced by exposure to markets. Moreover, a recent experimental investigation demonstrated that market priming has a causal effect on trust (Al-Ubaydli, Houser, Nye, Paganelli, & Pan, 2013). This experiment found that American college students who were primed using phrases related to the market exhibited higher level of trust in trust games with anonymous strangers. This may be due to the fact that the market meant a process of experiencing benefits from interactions with strangers for these American college students, which increased their levels of trust in strangers.

The findings that the market has a positive influence on trust cited above are less than convincing, both in terms of methodology and the generalizability of conclusions. For example, some studies inferred causality in their conclusion that the market can promote trust based on observation or investigation (e.g. Henrich et al., 2001, 2010), without eliminating alternative explanations. Moreover, in different cultures and societies, the concept of "market economy" may have different implications, as well as different effects on people's psychology, e.g., cooperation, trust. Al-Ubaydli et al. (2013) demonstrated that the mental representation of the market promotes trust. They believed that the market has a system of ensuring the security of interactions in American. However, Xin and Liu (2013) found that profit calculation activates Chinese participants' homo economicus belief and then inhibits their trust, perhaps due to the fact that the stress of self-interested instinct of market entities enables participants distrust in strangers.

To sum up, previous empirical studies seem to support the destructive effect of the market on trust, especially for Chinese participants, although some opposite findings exist. However, the conclusions of all of these studies were reached at the individual level rather than the group or societal level. Thus, despite the presence of this body of research, it is difficult to say more about the macro-level relationship between the marketization process and changes in trust levels in China.

1.4. The present research

We conducted two studies to investigate the macro-level relationship between marketization and trust. In Study 1 we performed a cross-temporal meta-analysis (Twenge, 2000, 2010; Twenge & Campbell, 2001; Xin & Zhang, 2009; Xin, Zhang, & Liu, 2010) to confirm our hypotheses that the levels of interpersonal trust among Chinese college students decreased over the past ten years, and that the decline in trust was associated with and predicted by the levels of marketization. In Study 2, we adopted a correlational design to investigate the correlational patterns of marketization and trust among different provinces of China at the group level.

2. Study 1

In Study 1, we performed a cross-temporal meta-analysis to test the hypothesis that interpersonal trust levels of Chinese college students have been declining across birth cohorts. We also used a time-lag analysis to examine correlations between

interpersonal trust and marketization over time in order to explore the predictive effect of marketization on interpersonal trust levels over the past decade.

2.1. Method

2.1.1. Literature search and inclusion rules

In China, the Chinese version of the Interpersonal Trust Scale (ITS) developed by Rotter (1967) is the most popular instrument to measure interpersonal trust. The ITS consists of 11 positive items (e.g., "*Parents usually can be relied upon to keep their promises*") and 14 negative items (e.g., "*In dealing with strangers one is better off to be cautious until they have provided evidence that they are trustworthy*"). Participants are asked to respond to each item with a 5-point Likert scale (1 = *strongly agree*, 5 = *strongly disagree*). The total interpersonal trust score is obtained by computing the sum of 25 items ($25 \leq$ expected value ≤ 125), with a higher score indicating a higher level of interpersonal trust. The Chinese version of the scale has demonstrated adequate reliability and validity (e.g., Chen, 2011; Luo & Zhou, 2007; Ma, 2014; Wang, Wang, & Ma, 1999).

We collected the original studies reporting college students' scores on Rotter's Interpersonal Trust Scale (ITS) for our cross-temporal meta-analysis. These studies were mainly selected by searching the three most widely used Chinese academic literature databases: Wanfang, CNKI, and Chongqing VIP. Together, these databases cover most Chinese social science journals (including psychology and all related subjects) since 1985, as well as a large number of the doctoral dissertations and master's theses written after 1995.

Possible studies for the cross-temporal meta-analysis were selected on the basis of the following specific set of rules to ensure that the included studies were homogeneous and comparable in terms of both samples and data collection procedures. To be included, a study had to meet the following criteria: (1) participants were college students at conventional four-year institutions (e.g., not three-year colleges, not military academies); (2) participants all came from mainland China; (3) the study included at least 30 male or 30 female participants; (4) means and sample sizes of the total sample or unselected subgroups were reported; (5) participants were not clients at a counseling center or any other group singled out for being maladjusted; (6) participants did not complete the measure during a time constrained period (e.g., the time before an exam).

These literature collection and inclusion strategies yielded 82 interpersonal trust studies involving 34,151 college students from 1998 to 2011 (the year of data collection). Detailed information on the studies included in the analyses was not included in the current publication due to space limitations, but the data set is available on request.

2.1.2. The coding of main variables and control variables

For each study, the average interpersonal trust score, sample size, and publication year were recorded for cross-temporal meta-analysis. Furthermore, the year of data collection, which can indicate participants' birth cohort, was coded as 2 years prior to publication unless another date was reported in the article (e.g., Oliver & Hyde, 1993; Twenge & Campbell, 2001; Xin et al., 2010).

It is possible that samples in each study may differ in gender ratio, region, and publication class in a way that confounds them with birth cohorts. Therefore, these variables were used as controls in the analyses. In the past decade, more females entered college: approximately 51% of college students were female in 2011, however, the percentage was 40% in 1999 (National Bureau of Statistics of China, 2012). Thus, we controlled the effect of gender ratio and examined the data separately by gender. In China, the average economic level varies with geographical regions. Similar to previous literature (e.g., Liu & Xin, 2015; Xin et al., 2010), in the present meta-analyses, the regions of the included studies were coded into East, Northeast, Middle, West (in descending rank of economic level) and "mixed". If participants in a study were from two or more regions, the region was coded as "mixed". Publication classes were coded into three classes: first class (journals covered by Chinese Social Sciences Citation Index and Chinese Science Citation Database), second class (other journals), and third class (dissertations and master's theses).

2.1.3. Sources for marketization statistics

Considering the criteria suggested by previous studies (e.g., Fan, Wang, Zhang, & Zhu, 2003; Fan, Wang, & Zhu, 2011; Fan et al., 2011), we chose the NERI (National Economic Research Institute, China Reform Foundation) index of marketization (MI) as an indicator of the level of marketization, with high values indicating high level of marketization, which embodies in 5 aspects: the relationship between the government and the market (MI-1); the development of a non-public economy (MI-2); the development of a product market (MI-3); the development of a factor market (MI-4); and the development of a market intermediary and a legal institution environment (MI-5). All of these statistics of the marketization index (which included data from the whole country and different provinces) were selected from 1997 to 2010 for analysis.

2.1.4. Data analytic strategy

In this study, the technique of cross-temporal meta-analysis was used. In contrast to the traditional meta-analysis, the cross-temporal meta-analysis compares participants from a certain age in a particular historical period with participants from the same age in other particular historical periods (e.g., Gentile, Twenge, & Campbell, 2010; Twenge, 2000, 2010; Twenge & Campbell, 2001). This technique does not compute an effect size for each study but instead examines the change in mean scores on psychological measures over time (e.g., Liu & Xin, 2015; Twenge, 2000, 2010; Xin & Zhang, 2009; Xin et al.,

2010). By recording the year of scale administration and the mean scores on the scale (such as ITS) in a series of comparable samples, this technique makes it possible to study birth cohort differences (e.g., Twenge, 2000, 2010; Twenge & Campbell, 2001; Twenge & Im, 2007).

To calculate the magnitude of changes in interpersonal trust scores over time, we used a regression equation and the average standard deviation (*SD*) of the individual samples. To compute the mean scores for specific years (e.g., 1998 or 2011), we used the regression equation: $y = B\,x + C$, where x = the year, y = the predicted mean interpersonal trust score, B = the unstandardized regression slope coefficient, and C = the intercept or constant. This formula yielded the expected average interpersonal trust for particular years. In line with previous studies (e.g., Gentile et al., 2010; Twenge & Im, 2007; Twenge, Zhang, & Im, 2004; Xin & Zhang, 2009), we obtained the average *SD* by averaging all the standard deviations reported in the studies (reflecting the average variance of the measure in a sample of individuals).

To further determine the effects of marketization on changes in Chinese college students' interpersonal trust, we considered the marketization index as one indicator of the development of marketization and matched the marketization index of each year (the independent variable) with the means of each interpersonal trust study of the year (the dependent variable). The correlations between the two variables were then calculated. All analyses and data management were performed in SPSS 18.0.

2.2. Results and discussion

2.2.1. Correlations between mean scores of interpersonal trust and year

We conducted regression analysis with interpersonal trust scores and year of data collection as the dependent and independent variables and all of the controlling variables as covariates. The result showed that the interpersonal trust of Chinese college students decreased between 1998 and 2011 (see Fig. 1). When region, publication class and gender ratio were controlled and sample size was weighted, the correlation between interpersonal trust scores and year of data collection was -0.42, $p < 0.001$, 95%CI = [-0.59, -0.23]; without controlling for these variables, the correlation was also significant, $\beta = -0.36$, $p = 0.001$, 95%CI = [-0.54, -0.16]. We also analyzed single-gender means when they were reported. Separate analyses for college men and college women, with the controls included, revealed similar results. The correlations between interpersonal trust scores and year among college men and college women were both significant when weighted by sample size ($\beta_{men} = -0.40$, $p = 0.003$, 95%CI = [-0.59, -0.13]; $\beta_{women} = -0.36$, $p = 0.007$, 95%CI = [-0.54, -0.11]), which suggested that interpersonal trust scores of Chinese college students decreased over time among both men and women. Thus, changes in Chinese college students' trust were not due to the increasing numbers of women in college samples, which occurred for both males and females.

The above results show that the interpersonal trust levels of Chinese college students decreased across birth cohorts. However, these results provide no insight as to how much interpersonal trust decreased. To calculate the magnitude of change in the trust scores, we used the weighted regression equation to predict the mean scores of the first and last year of the included studies. The mean decreased by 9.03, from 79.57 in 1998 to 70.54 in 2011. We calculated the average standard deviation by averaging all the standard deviations reported in the studies. The average standard deviation reported for the individual samples (from the articles we collected) is 8.44. Thus, interpersonal trust scores decreased 1.07 standard deviations from 1998 to 2011, that is $d = 1.07$. According to Cohen's (1977) guidelines, $d = 0.80$ is classified as large, and $d = 0.50$ is medium. Therefore, $d = 1.07$ should be considered a large effect size.

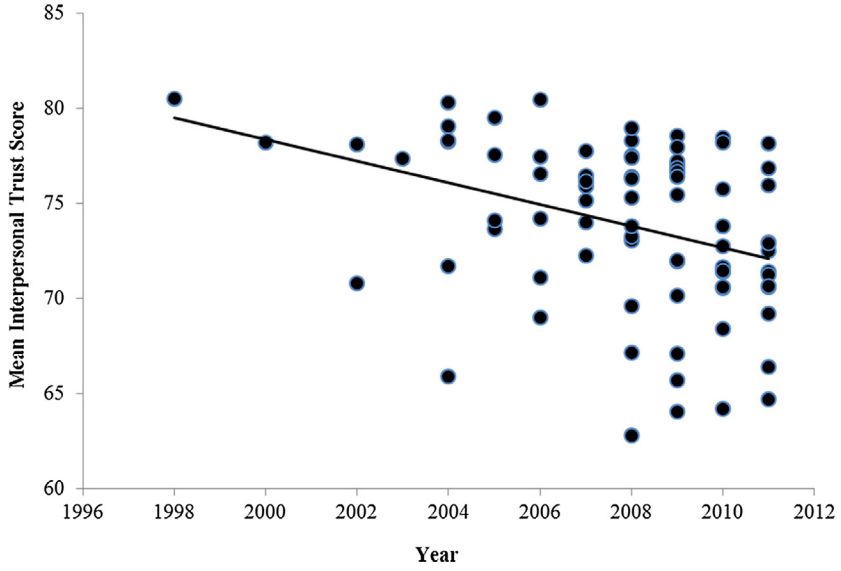

Fig. 1. Changes in Chinese college students' interpersonal trust, 1998–2011. The number of samples is 82.

If we converted the standard deviation change into percentile scores, the result is more understandable. If the average Chinese college student in 1998 scored at the 50th percentile of the distribution, the average student in 2011 scored at the 14th percentile (assuming a normal curve). We converted the *d* value (1.07) into variance explained by year and found the proportion was 22.25%. The result obtained from the regression equation without control was similar. Without controls, the mean decreased by 7.36, 0.87 *SD*s. We converted the *d* value (0.87) into variance explained by year and found the proportion was approximately 15.91%.

2.2.2. Correlations of college students' interpersonal trust with the marketization index

What has caused interpersonal trust to decrease so much over time? Correlating interpersonal trust scores directly with the marketization index provides insight into possible causes of the decline in Chinese college students' interpersonal trust. Similar to previous literature (e.g., Xin & Xin, 2016), in order to maximize the use of matching data in the present meta-analyses, the marketization index was matched with the interpersonal trust data in five ways: three years before the data were collected, one year before the data were collected, the year of data collection, one year after the data were collected, and three years after the data were collected (see Table 1). If the correlations between the marketization index scores of three years prior, one year prior or the year of data collection and the interpersonal trust scores were significant, but the correlations between the marketization index scores of one year or three years after and the interpersonal trust scores were not significant, the marketization index could predict interpersonal trust change, but not vice versa. It is believed that the time lag of one year or three years introduced in the correlation analysis can help us to determine which variables changed before, so as to build an effective prediction relationship between the two variables (Twenge, 2000).

Results showed that the correlations between the marketization index scores of one year or three years prior and the interpersonal trust levels appeared stronger than the correlations between the marketization index scores for the year of data collection and the interpersonal trust levels. However, nearly all correlations between the marketization index scores of one year or three years after and the interpersonal trust levels were not significant (see Table 1). That is, the marketization index scores of one year or three years prior predicted the changes in trust, which suggested that the increase in the marketization levels may be one crucial predictor for the decline of trust in China.

In summary, these results supported our hypotheses that Chinese college students' interpersonal trust was decreasing over the past ten years, and the decrease in trust was associated with and predicted by the marketization index of one year or three years prior.

3. Study 2

Marketization in China not only is a gradual process, but also shows an unbalanced pattern across regions. In Study 2, we adopted a cross-sectional correlational design to determine the correlational pattern of marketization and interpersonal trust among different provinces of China.

3.1. Method

3.1.1. Data on the marketization index in different provinces

Data on the marketization index in different provinces (the dataset comprises 29 Chinese provinces from 1997 to 2010) were identical to those mentioned in Study 1, so we present no further tautology here. In the present study, we used only the data on the marketization index in 29 Chinese provinces in 2010.

Table 1
Correlations between the marketization index and college students' interpersonal trust scores, weighted by sample size, 1998–2011.

Predictors	Three years prior		One year prior		Actual year		One year after		Three years after	
	β	95%CI	*β*	95%CI	*β*	95%CI	*β*	95%CI	*β*	95%CI
MI	−0.35**(81)	[−0.52, −0.14]	−0.35**(82)	[−0.52, −0.12]	−0.24*(69)	[−0.40, −0.08]	−0.28*(57)	[−0.44, −0.07]	−0.19 (29)	[−0.42, 0.23]
MI-1	−0.35**(81)	[−0.53, −0.11]	−0.26*(69)	[−0.44, −0.10]	−0.05(57)	[−0.26, 0.20]	0.02(42)	[−0.33, 0.34]	−0.09 (21)	[−0.41, 0.43]
MI-2	−0.34**(81)	[−0.52, −0.13]	−0.34**(69)	[−0.51, −0.13]	−0.32*(57)	[−0.49, −0.05]	−0.29(42)	[−0.47, 0.02]	−0.19 (21)	[−0.48, 0.29]
MI-3	−0.29**(81)	[−0.49, −0.02]	−0.16(69)	[−0.46, 0.22]	0.16(57)	[−0.16, 0.37]	0.13(42)	[−0.31, 0.41]	0.03 (21)	[−0.45, 0.53]
MI-4	−0.31**(81)	[−0.51, −0.08]	−0.34**(69)	[−0.54, −0.06]	−0.24*(57)	[−0.42, −0.01]	−0.28(42)	[−0.52, 0.01]	−0.12 (21)	[−0.45, 0.41]
MI-5	−0.35**(81)	[−0.55, −0.14]	−0.34**(69)	[−0.54, −0.13]	−0.36**(57)	[−0.57, −0.06]	−0.39*(42)	[−0.63, −0.03]	−0.30 (21)	[−0.64, 0.11]

Note. MI = the marketization index, MI-1 = the relationship between the government and the market, MI-2 = the development of a non-public economy, MI-3 = the development of a product market, MI-4 = the development of a factor market, MI-5 = the development of a market intermediary and a legal institution environment. *N* of samples is shown in parentheses, and *N* varies from 21 to 82 because of missing indicators for some years.

* $p < 0.05$.

** $p < 0.01$.

3.1.2. Data on interpersonal trust levels in different provinces

Data on interpersonal trust levels in 29 Chinese provinces were taken from the Chinese General Social Survey (CGSS) launched by the National Survey Research Center of Renmin University of China. The CGSS launched in 2003, is the earliest nationally representative, continuous survey project that adopted a four-phase stratified sampling method, including: county (district), town (street), village (neighborhood committee) and household. The CGSS is intended to systematically gather longitudinal data on social trends in Chinese mainland, and to monitor Chinese behavior and attitudes amidst dramatic social change. Cycle I of the CGSS took place between 2003 and 2008, with 5 annual surveys in 2003, 2004, 2005, 2006, and 2008. Cycle II of the CGSS began in 2010 and continues through 2019, with a total of five surveys conducted, one every two years.

Considering the data-matching process targeting interpersonal trust levels and the existing marketization index, we used the data on interpersonal trust from the 2010 CGSS. The sample of data on interpersonal trust was available for 11,601 participants (6041 females; M_{age} = 47.27 years, SD = 15.68), which included 7067 participants from urban areas and 4534 participants from rural areas. Participants from different provinces were requested to respond to two items adapted from the Survey Research Center (1969), which measured interpersonal trust toward others. The two items were as follows: (1) "*Generally speaking, most people can be trusted in this society*"; and (2) "*Generally speaking, you can't be too careful in dealing with people in this society, most people would try to take advantage of you if they got the chance*" (reverse scoring). Participants were instructed to rate each item using a 5-point Likert scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Each province's interpersonal trust scores that served as the dependent variable were obtained by summing up the responses to these two items, with higher scores indicating higher levels of interpersonal trust.

In addition, there were several potential confounding factors (e.g., media usage, the ratio of participants from urban and rural areas) that may have influenced trust levels. Therefore, we also used the data on participants' media usage (e.g., newspaper, radio, television and Internet) from the 2010 CGSS to examine the effect of media on trust levels. Participants were instructed to rate each item (e.g., "*What is your usage of television in the past year*") using a 5-point Likert scale (1 = *never*, 2 = *seldom*, 3 = *sometimes*, 4 = *often*, 5 = *always*). Scores of media usage for each province were obtained by summing up the responses to these items, with higher scores indicating higher levels of media usage. The ratios of participants from urban and rural areas in each province were also computed, in order to examine the ratio's effect on trust levels.

3.2. Results and discussion

To determine the relationship between the marketization indexes and the interpersonal trust levels among different provinces, we matched each province's interpersonal trust scores with their marketization index scores, and used a cross-sectional correlational design to examine the correlational pattern of the two variables. We found that the correlation between interpersonal trust and the marketization index was significant, $r = -0.43$, $p = 0.02$, 95%CI = [−0.75, −0.04] (see Fig. 2). To further examine the predictive effect of marketization on interpersonal trust, we conducted a regression with the marketization index as an independent variable and interpersonal trust as a dependent variable. When the sample size was weighted, the regression coefficient between the marketization indexes and the interpersonal trust scores was also significant, $\beta = -0.42$, $p = 0.02$, 95%CI = [−0.71, −0.11]. That is, the higher the marketization index of a province was, the lower its residents' trust performed.

We also examined the effect of the potential confounding factors, including the usage of media, and the ratio of participants from urban and rural areas. The results showed that the correlation between the media usage in the 29 provinces and their interpersonal trust scores was not significant ($r = -0.31$, $p = 0.11$, 95%CI = [−0.71, 0.06]), and the correlation between the ratios of participants from urban and rural areas of the 29 provinces and their interpersonal trust scores was also not significant ($r = -0.34$, $p = 0.09$, 95%CI = [−0.77, 0.06]), therefore we did not control the effect of these variables in the above regression analysis.

4. General discussion

4.1. The trust decline in China: out of college students

As it is introduced, previous research found that Chinese college students' levels of interpersonal trust declined between 1998 and 2009 (Xin & Zhou, 2012). However, Xin and Zhou (2012) only depicted the declining trend in Chinese college students' levels of interpersonal trust, and did not examine how the decline of trust was influenced by social variables (e.g., the level of marketization) of the background of the market economy. Therefore, in Study 1, we added 29 studies in 2010 and 2011 to the previous research (Xin & Zhou, 2012) and performed a cross-temporal meta-analysis involving 82 studies to evaluate the changes in Chinese college students' levels of interpersonal trust from 1998 to 2011. We found a systematic decrease in Chinese college students' scores on the Chinese version of the Interpersonal Trust Scale (ITS) over the past ten years, and the decreasing trends of interpersonal trust occurred among both men and women. These findings were consistent with the results of previous research (Xin & Zhou, 2012), and provided more convincing evidence to support the increasingly popular idea that Chinese college students' levels of interpersonal trust have decreased along with social changes.

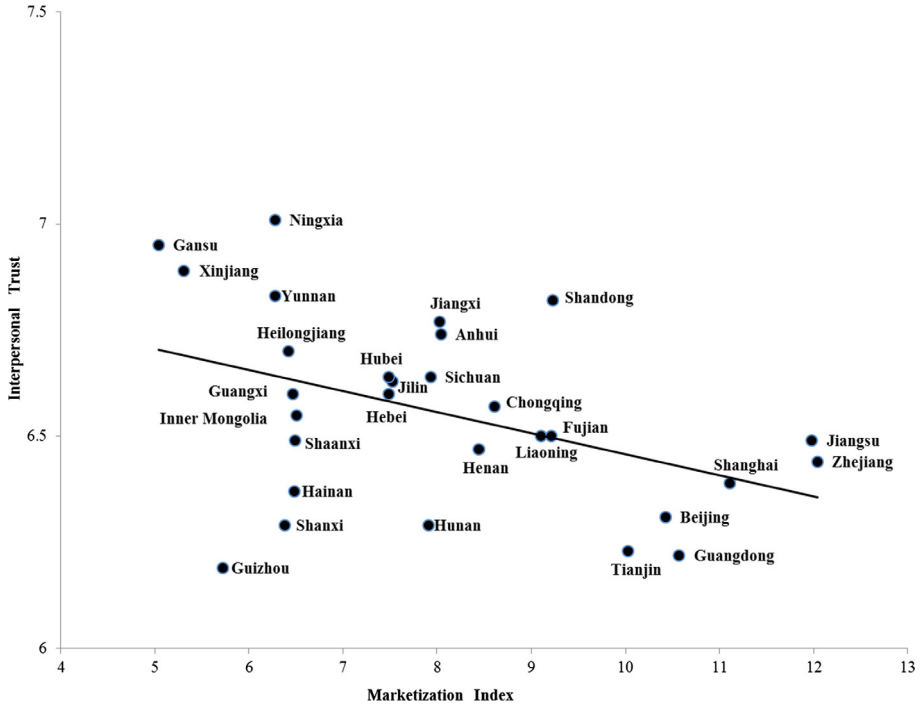

Fig. 2. The relationship between different provinces' interpersonal trust and their marketization index in 2010. The number of samples is 29.

It is worth noting that the declining trend of trust should not be attributed solely to college students. Trust is a two-way process involving both trustee and trustor. What the ITS measures is how one person shows trust in others (especially strangers) and society. Thus, the hidden subtext of the trust decline among college students is that others and society do not deserve trust as they once did. In other words, the social trust in contemporary China is declining. The World Values Survey and the Asian Barometer Survey on Chinese resident samples have found that social trust in China decreased between 1990 and 2003 (Ma, 2008), confirming our conclusion.

4.2. The marketization process negatively predicts trust: longitudinal and cross-sectional evidence

Although a lot of economics literature contends that trust promotes economic development in different countries and areas (e.g., Algan & Cahuc, 2010, 2013; Bjørnskov, 2006, 2012; Knack & Keefer, 1997; Zak & Knack, 2001; Zhang & Ke, 2002), we can't draw the conclusion that the level of China's economic development promotes its level of trust. To sum up, the present research proposed and demonstrated that marketization (a key indicator of economic development in China) was negatively associated with trust on the longitudinal and cross-sectional levels.

Study 1 provided a unique opportunity to examine the relationship between interpersonal trust and marketization over a long period. No study has previously investigated how the change patterns of the two variables correlated over birth cohorts at the group level. The time-lag analysis in Study 1 showed that the correlations between the marketization index scores of one year or three years prior and the interpersonal trust scores for each study were significantly negative, however, almost all correlations between the marketization index scores of one year or three years after and the interpersonal trust scores were not significant. Thus, it can be safely concluded that the decrease in interpersonal trust across birth cohorts among Chinese college students was associated with and predicted by the marketization index of one year or three years prior, which provides evidence to explain the decline of interpersonal trust at the longitudinal level. However, the trust levels could not predict the subsequent marketization levels.

Besides the longitudinal evidence, based on the cross-regional analysis, Study 2 demonstrated that marketization and trust were negatively correlated across 29 Chinese provinces. That is, the higher the level of marketization in a province, the lower its level of trust. On the whole, the levels of marketization of Guangdong, Shanghai, Zhejiang and Jiangsu provinces were highest, but their trust levels were among the lowest; in contrast, the levels of marketization of Gansu, Xinjiang, Ningxia and Yunnan provinces were lowest, while their trust levels were among the highest.

Integrating the longitudinal and cross-sectional evidence, we argued that the marketization process, or the development of the market economy in China, predicts the decline of trust. Thus, a gap appears between the present findings and previous empirical results (e.g., Algan & Cahuc, 2010, 2013; Bjørnskov, 2006, 2012; Knack & Keefer, 1997; Zak & Knack, 2001). All these previous studies reached conclusions that trust promotes economic growth based on cross-country or -region data;

however, because of the lack of time-lag analysis, there are great risks in making causal conclusions. The regression model used in these studies may simply show a correlational relationship, rather than a causal relationship. In contrast, the present research (Study 1) establishes a clear predictive relationship, clarifying that it is marketization that negatively predicts subsequent trust, and not vice versa. Moreover, Study 2 used a similar cross-regional analysis with the previous studies, but still did not find any positive correlation between marketization and trust. On the contrary, a negative correlation between the marketization levels and the trust levels in 29 Chinese provinces in 2010 was revealed. It seems puzzling why China is an exception among global players.

In our opinion, the present findings are both rational and understandable. As mentioned before, in the marketization process, market mechanisms encourage benefit maximization, efficiency optimization, competition and the pursuit of material interests. Thus, both individuals and enterprises have strong self-interested motives. Under conditions that lack powerful social norms or rules (e.g., credit management system), each market entity has the chance to cheat and exploit others' benevolence and integrity. People come to realize that many or most other people cannot be trusted, so they cannot be too careful in dealing with others. Without strict restrictions or rules, the market stands for the law of the jungle, which is dangerous to trust. The process has been revealed at the individual or micro level that the market and economic participation can inhibits individuals' trust (Cohn et al., 2014; Reeson & Tisdell, 2010; Xin & Liu, 2013; Xin et al., 2013).

Over the past 30 years, the central goal of economic reform in China has been to establish a socialist market economy. We have to confess that it is the marketization process that provides strong dynamics for economic development. However, because of its imperfections and limitations, it also continuously erodes the basis of economic development: trust. As the present research and previous literature (Ma, 2008; Xin & Zhou, 2012) show, one consequence is the decline in trust across birth cohorts of college students and all residents; another is that the higher the marketization level of a province is, the lower its residents' trust performs. Similar phenomena also occur in other countries and regions. For instance, some post-communist societies (e.g., Russia) have experienced decreasing trust levels following the fall of the communist regimes, which have been regarded as the product of income inequality (Bjørnskov, 2006).

4.3. Implications and limitations

To our knowledge, the present research is the first to propose and prove that the marketization process in China serves as a potential cause or at least a predictor of trust decline across time and regions. It challenges the traditional view of trust positively correlating to market economy growth.

Although there is no doubt that trust, as social capital (Fukuyama, 1995), as well as energy and environmental conditions can promote market economy development, we cannot draw an affirmative converse proposition since some defects and limitations in the marketization process might produce excessive consumption of trust and credit. The decline of trust is casting shadows on the prospect of economic development. The current decrease in growth speed in China has implied that it is time to change the resource-driven growth pattern (including overspending trust) and rebuild a high-trust society (Fukuyama, 1995). In sum, we not only admit that marketization plays a huge role in promoting China's economic development, but also recognize the problem of psychological costs (e.g., the decline of trust) in the process of marketization. We do not oppose the market economy but expect a healthier market economy, in which the market mechanism and the legal mechanism should be balanced to protect trustors.

Notwithstanding its contributions, the present research exhibits some limitations. As in any meta-analysis, interpretations of the results of this study are limited to the samples available. Future research might examine changes in interpersonal trust among other populations—for instance, younger adolescents or general residents. In addition, to obtain causal relationship knowledge, future research should employ an experimental design to identify how the marketization process inhibits trust.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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References

Algan, Y., & Cahuc, P. (2010). Inherited trust and growth. *American Economic Review, 100*, 2060–2092.
Algan, Y., & Cahuc, P. (2013). Trust and growth. *Annual Review of Economics, 5*, 521–549.
Al-Ubaydli, O., Houser, D., Nye, J., Paganelli, M. P., & Pan, X. S. (2013). The causal effect of market priming on trust: An experimental investigation using randomized control. *PLoS ONE, 8*(3), e55968.
Barber, B. (1983). *The logic and limits of trust*. New Brunswick, NJ: Rutgers University Press.
Bjørnskov, C. (2006). Determinants of generalized trust: A cross-country comparison. *Public Choice, 130*, 1–21.
Bjørnskov, C. (2012). How does social trust affect economic growth? *Southern Economic Journal, 78*, 1346–1368.

Chen, X. F. (2011). A study on the relationship between undergraduates' interpersonal trust and social support. *Journal of Changchun University, 21*, 105–107.
Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic.
Cohn, A., Fehr, E., & Maréchal, M. A. (2014). Business culture and dishonesty in the banking industry. *Nature, 516*, 86–89.
Covey, S. M. R., & Merrill, R. R. (2006). *The speed of trust: The one thing that changes everything*. New York: Simon & Schuster.
Fan, G., Wang, X. L., & Ma, G. R. (2011). Contribution of marketization to China's economic growth. *Economic Research Journal, 9*, 4–16.
Fan, G., Wang, X. L., Zhang, L. W., & Zhu, H. P. (2003). Marketization index for China's provinces. *Economic Research Journal, 3*, 9–18.
Fan, G., Wang, X. L., & Zhu, H. P. (2011). *NERI index of marketization of China's provinces*. Beijing: Economic Science Press.
Fukuyama, F. (1995). *Trust: The social virtues and creation of prosperity*. London: Hamish Hamilton.
Gentile, B., Twenge, J. M., & Campbell, W. K. (2010). Birth cohort differences in self-esteem, 1988–2008: A cross-temporal meta-analysis. *Review of General Psychology, 14*, 261–268.
Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E., Gintis, H., & McElreath, R. (2001). In search of homo-economicus: Behavioral experiments in 15 small-scale societies. *American Economic Review, 91*, 73–78.
Henrich, J., Ensminger, J., McElreath, R., Barr, A., Barrett, C., Bolyanatz, A., ... Ziker, J. (2010). Markets, religion, community size, and the evolution of fairness and punishment. *Science, 327*, 1480–1484.
Herrmann, B., Thöni, C., & Gächter, S. (2008). Antisocial punishment across societies. *Science, 319*, 1362–1367.
Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff: A cross-country investigation. *The Quarterly Journal of Economics, 122*, 1251–1288.
Liu, D., & Xin, Z. Q. (2015). Birth cohort and age changes in the self-esteem of Chinese adolescents: A cross-temporal meta-analysis, 1996–2009. *Journal of Research on Adolescence, 25*, 366–376.
Luhmann, N. (1979). *Trust and power*. London: John Wiley & Sons.
Luo, R., & Zhou, Q. (2007). Analysis of social support and interpersonal trust in junior students of universities. *Modern Preventive Medicine, 34*, 329–330.
Ma, D. Y. (2008). Trust, the origin and change of trust. *Open Times, 4*, 72–86.
Ma, R. X. (2014). Research on interpersonal trust, social support and interpersonal communication of college students in Fujian province. *Journal of Chongqing Technology and Business University (Social Sciences Edition), 31*, 156–160.
National Bureau of Statistics of China (2012). *China statistical yearbook*. Beijing: China Statistic Press.
Oliver, M. B., & Hyde, J. S. (1993). Gender differences in sexuality: A meta-analysis. *Psychological Bulletin, 114*, 29–51.
Reeson, A. F., & Tisdell, J. G. (2010). The market instinct: The demise of social preferences for self-interest. *Environmental & Resource Economics, 47*, 439–453.
Rotter, J. B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality, 35*, 651–665.
Survey Research Center (1969). *1964 election study*. Ann Arbor, Michigan: Inter-University Consortium for Political Research, University of Michigan.
Twenge, J. M. (2000). The age of anxiety? Birth cohort change in anxiety and neuroticism, 1952–1993. *Journal of Personality and Social Psychology, 79*, 1007–1021.
Twenge, J. M. (2010). Birth cohort increases in narcissistic personality traits among American college students, 1982–2009. *Social Psychological and Personality Science, 1*, 99–106.
Twenge, J. M., & Campbell, W. K. (2001). Age and birth cohort differences in self-esteem: A cross-temporal meta-analysis. *Personality and Social Psychology Review, 5*, 321–344.
Twenge, J. M., & Im, C. (2007). Changes in the need for social approval, 1958–2001. *Journal of Research in Personality, 41*, 171–189.
Twenge, J. M., Zhang, L., & Im, C. (2004). It's beyond my control: A cross-temporal meta-analysis of increasing externality in locus of control, 1960–2002. *Personality and Social Psychology Review, 8*, 308–319.
Wang, X. D., Wang, X. L., & Ma, H. (1999). *Handbook of mental health assessment*. Beijing: Chinese Mental Health Journal Press.
Xin, Z. Q., Dou, D. H., & Chen, C. (2013). Does economics encourage interpersonal distrust? Impact of economics major learning on undergraduates' interpersonal trust. *Advances in Psychological Science, 21*, 31–36.
Xin, Z. Q., & Liu, G. F. (2013). Homo economicus belief inhibits trust. *PLoS ONE, 8*(10), e76671.
Xin, S. F., & Xin, Z. Q. (2016). Birth cohort changes in Chinese college students' loneliness and social support: One up, as another down. *International Journal of Behavioral Development, 40*, 398–407.
Xin, Z. Q., & Zhang, M. (2009). Changes in Chinese middle school students' mental health (1992–2005): A cross-temporal meta-analysis. *Acta Psychologica Sinica, 41*, 69–78.
Xin, Z. Q., Zhang, L., & Liu, D. (2010). Birth cohort changes of Chinese adolescents' anxiety: A cross-temporal meta-analysis, 1992–2005. *Personality and Individual Differences, 48*, 208–212.
Xin, Z. Q., & Zhou, Z. (2012). A cross-temporal meta-analysis of changes in Chinese college students' interpersonal trust. *Advances in Psychological Science, 20*, 344–353.
Zak, P. J., & Knack, S. (2001). Trust and growth. *The Economic Journal, 111*, 295–321.
Zhang, W. Y., & Ke, R. Z. (2002). Trust in China: A cross-regional analysis. *Economic Research Journal, 10*, 59–70.