The causal effect of social capital on income: A new analytic strategy

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ARTICLE INFO

ABSTRACT

This study identifies three groups of job seekers in terms of the channels used to search for jobs: the formal channel involving only official procedures to obtain a job, the informal channel using only social contacts to obtain a job, and the joint channel leveraging both social contacts and official procedures. The analysis of a national sample survey of China shows that joint channel users, due to their relatively higher level of social capital, not only make more job search attempts but also obtain higher income than formal channel users. Meanwhile, joint channel users, because of their relative advantages in both human capital and social capital, not only make more job attempts but also obtain higher income than informal channel users. The two comparisons offer a new strategy to test the causal role social capital plays in labour market success, regardless of whether social capital is exogenous or endogenous to human capital.

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1. Introduction

Social capital theories have long argued that the use of personal contacts in the search for employment leads to higher wages and higher occupational status. Personal contacts are thought to give access to valuable resources such as information and influence, which lead to better jobs (Granovetter, 1973; Lin, 2001). Although empirical evidence partly confirmed this hypothesized effect of social capital on labour market outcomes (see reviews by Granovetter, 1995; Lin, 1999), questions have been raised about the causality of this effect. Mouw (2003), in particular, argued that social capital may be largely endogenous to human capital, as individuals with higher education have more social capital.

In his critique of the social capital effect, Mouw (2003) identified two sources of endogeneity. The first is homophily, the tendency of people to socialize with others who are similar to themselves (McPherson and Smith-Lovin, 1987), which implies that the occupational statuses of an individual's personal contacts are correlated with his/her own status. To address this source of endogeneity, several scholars have proposed and adopted advanced tests (Bian et al.,

2015; Chen, 2012; Chen and Volker, 2016; Fernandez and Galperin, 2014; Lin and Ao, 2008; McDonald, 2015), and concluded that even after controlling for this type of endogeneity there is still a significant effect of contact use on labour market outcomes in both market and nonmarket economies.

The second source of endogeneity, however, has largely been overlooked in examinations of the role social capital plays in labour markets. This source of endogeneity is associated with reservation wage, a theoretical and unobservable lowest wage a rational worker would be willing to accept so as to complete the job search (Montgomery, 1992). Mouw (2003:870-1) argues that reservation wage is the determinant of job search outcomes, and that causal examinations of job search outcomes should focus on reservation wage, rather than obtained wage. According to Mouw, social capital can be argued as a cause of job search outcomes *if and only if* contact use contributes to the increase in reservation wage. The problem of endogeneity occurs when one's social capital is highly correlated with one's human capital, as the relationship between social capital and reservation wage might be explained by the effect of human capital. Demonstrating a causal relation between social capital and reservation wage is empirically challenging, because reservation wage is not only unobservable, but it also varies with the probability of receiving job offers, as well as the wage accompanying each offer (Montgomery, 1992; Mouw, 2003). At present, none of the existing analytical strategies (see a review by Chen, 2012) has been designed to reveal the causal role of social capital in reservation wage, with the effect of human capital taken into account.

In this study, we aim to address the above challenge by proposing a new analytic strategy. This strategy is based on the recognition of three groups of job seekers: Some job seekers use the formal channel to search for jobs, others use the informal channel, and still others use both the formal and informal channels. We term this third group of job seekers "joint channel users." We argue that the identification of the joint channel allows for a test concerning the causal effect of social capital on reservation wage, by making it possible to compare joint channel users with either formal or informal channel users. In the following part of this paper, we will elaborate on this strategy and perform an empirical analysis by drawing data from a countrywide Chinese survey.

2. The significance of the joint channel

Conventionally, job searches are dichotomized into two channels. The formal search channel includes the use of job ads, direct applications, employment services, and any other means without involving personal contacts. Human capital, in forms of education, skill training, and work experience, is the fundamental resource one uses in getting a job that satisfies one's reservation wage through the formal search channel (Mincer, 1974; Montgomery 1992; see also Mouw's review, 2003). The informal search channel, on the other hand, includes the means in which kin, friends, acquaintances, or any other types of personal contacts are mobilized to facilitate job obtainment (Bian, 1997; Boxman et al., 1991; Chua, 2011; De Graaf and Flap, 1988; Erickson 2001; Granovetter, 1973; Lin et al., 1981; Volker and Flap 1999; see also reviews by Granovetter, 1995; Lin, 1999). While all these personal contacts have been conceptualized as social capital and been demonstrated to play positive roles in job search outcomes, the extent to which social capital matters in determining reservation wage still requires further investigation.

Fig. 1 illustrates one scenario under the homophily assumption (social capital is dependent on human capital). The upper part of Fig. 1 shows an unobservable, theoretical causal relationship through which a worker's human capital determines his/her reservation wage. The lower part of Fig. 1 shows a positive correlation between the amount of social capital this same worker possesses and the wage he/she obtains, through contact use. Since human capital determines reservation wage (the upper part of Fig. 1) and at the same time is correlated with social capital (the left side of Fig. 1), the association between social capital and obtained wage (the lower part of Fig. 1) can be spurious, resulting from their common determinant – human capital.

The following example provides an illustration. Two individuals, termed A and B, share an identical set of human capital. A gets a job through personal referrals and accepts the wage offer. B gets the same job with the same wage offer from a different employer without using personal referrals. B's obtained wage is set by his/her reservation wage, which is solely determined by human capital. Since A obtains the same wage as B, it is logical to assume that A also shares the same level of reservation wage, which should be attributed to A's human capital that is identical to B's. In this case, A's use of personal referrals does not lead to an increase in his/her reservation wage; as a result, A's social capital, through contact use, has no causal effect on A's obtained wage.

Continuing with the above example, we reconsider the link between social capital and reservation wage in the following scenario. A and B, who share the same amount of human capital, get identical offers through the formal hiring procedure. A rejects the offer and continues to search, whereas B accepts the offer and completes the search. Eventually, through personal referrals A gets a better-paid job than B's. In this case, the job accepted by B satisfies B's reservation wage but not A's; A's social capital through contact use makes his/her reservation wage higher. Therefore, A's successful obtainment of a better paid job through contact use shows social capital's contribution to the increase in reservation wage, with the effect of human capital controlled.

The above-described scenario requires complete job-history information to establish a causal relationship between social capital and reservation wage. Unfortunately, such information is unavailable in large-scale social surveys, which provide information only about obtained jobs and wage outcomes, but not about rejected job offers. Statistically, the missing information about rejected job search outcomes causes the issue of truncation in survey datasets (Dodge, 2003; Wolynetz, 1979). To analyse how contact use matters for truncated job-search outcomes, we propose to rethink the theoretical assumption underlying job search channels. As aforementioned, previous studies tend to dichotomize job search behaviour into *either* the formal *or* the informal channel. This dichotomization implies correspondence between human capital and the formal channel, and between social capital and the informal channel. In reality, however, a good proportion of workers use *both* the formal and the informal channels to seek jobs. Our strategy is, therefore, to distinguish the use of the joint channel from that of either the formal or informal channel, and identify three groups of job seekers as follows.

First, Group F refers to job seekers who have successfully secured jobs only through the formal channel. It is reasonable to assume that their human capital is the only cause of their reservation wage. This is true even if this group of job seekers may in fact have high-quality contacts, since their contacts are *not* activated to influence their job searches. For this reason, by social capital in our discussion, we refer only to social contacts that have been activated to influence individuals' job search processes.
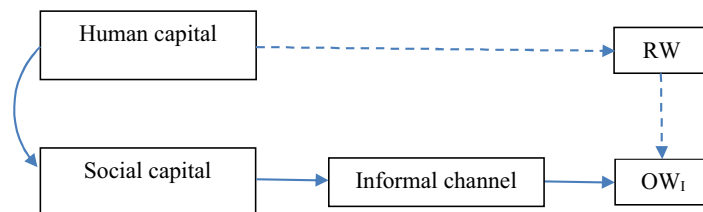
* RW – reservation wage; OW$_I$ – obtained wage through the informal channel. Solid lines represent observable links, while dash lines represent unobservable links. Straight arrow lines represent causal mechanisms. Curved arrow lines represent possible existence of endogeneity. The direction of the curved arrow line is from the source of endogeneity to the type of resource that is endogenously formed.

Fig. 1. Spurious correlation between social capital and obtained wage.
*RW – reservation wage; OW$_I$ – obtained wage through the informal channel. Solid lines represent observable links, while dash lines represent unobservable links. Straight arrow lines represent causal mechanisms. Curved arrow lines represent possible existence of endogeneity. The direction of the curved arrow line is from the source of endogeneity to the type of resource that is endogenously formed.
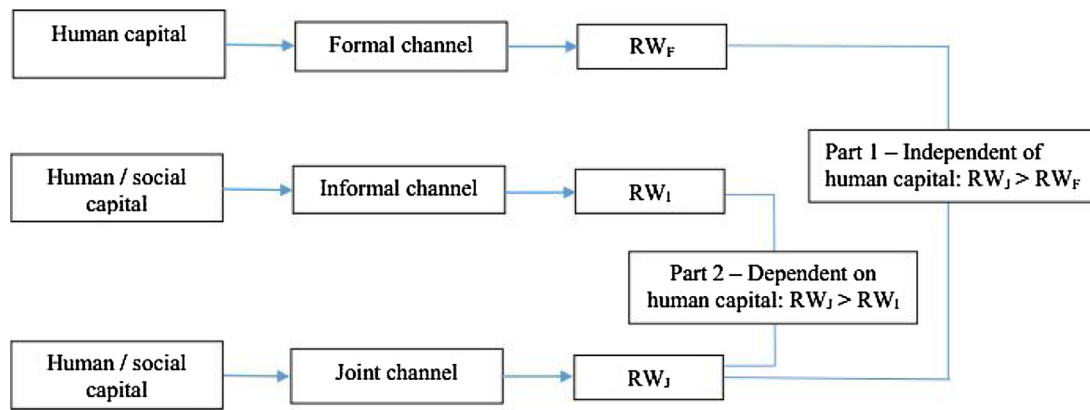
Fig. 2. A new analytic strategy to test the effect of social capital.

Second, Group I refers to job seekers who have successfully secured jobs only through the informal channel. For these job seekers, to what extent social capital contributes to reservation wage is not straightforward, because, according to the literature, individuals' human capital not only sets their reservation wage (Mincer, 1974) but it is also correlated with their social capital (Lin, 2001; Mouw, 2003). What can be certain about this group of job seekers is, however, that contact use does matter, as it is the only channel through which one obtains a job with a certain level of wage.

Third, Group J refers to job seekers who have successfully secured jobs through the joint channel. Here, we emphasize the coexistence of the formal and informal components in the joint channel; namely, a job position would not be achieved had either the formal or informal component been absent. The presence of human capital has a direct effect on reservation wage, which is similar to the scenario for formal channel users in Group F. At the same time, the presence of contact use also matters, similar to the scenario for informal channel users in Group I.

Therefore, a comparison between joint channel users and formal channel users will be able to show whether or not contact use contributes to the increase in reservation wage, on the top of the effect of human capital. A comparison between joint channel users and informal channel users, on the other hand, will be able to show whether or not a contact user possessing more human capital would hold a higher reservation wage than a contact user possessing less human capital.

3. Reservation wage and the causality test: hypotheses

Under the sequential search model, which assumes that an individual seeks jobs one by one, we conduct an indirect test about which of the three groups of job seekers tends to have a higher reservation wage. For each job search attempt in a sequential search process, according to Mouw (2003), the individual employs multiple job search strategies to maximize the chance of getting the targeted position in order to satisfy his/her reservation wage; with an offer in hand, the individual makes a decision about whether to accept the offer and exit the job search or reject it and continue the search. An attempt is successful only when the wage offer satisfies the job seeker's reservation wage. An unsuccessful job search attempt, therefore, contains two possibilities. One is that the original reservation wage is set too high, so that the job seeker has to lower his/her reservation wage to increase the chance of getting an offer in a new attempt. The other possibility occurs when a job seeker expects to obtain a better offer than what he/she already possesses, so that reservation wage rises as the search process goes on. If so, making more attempts benefits search outcomes, as the

more attempts one makes to find a job, the higher the wage one would obtain.

In short, in a sequential search process, reservation wage can be indirectly tested by linking job search attempts with the wage outcome eventually obtained. We argue that a job search channel leads to a higher reservation wage when (1) more search attempts are made through a particular channel and, at the same time, (2) higher wage is obtained through this channel.

Our strategy of testing the causal effect of social capital on reservation wage is therefore illustrated by two sets of comparisons, as shown in Fig. 2. The first set (Part 1) is between Group F and Group J, comparing formal channel users' reservation wage (RW_F) with joint channel users' reservation wage (RW_J). When the two groups of job seekers possess equivalent human capital, the difference between RW_F and RW_J is, we argue, due to social capital activated by the joint channel users. The result of this comparison is the evidence for a causal effect of social capital on reservation wage, independent of human capital. Since the formal channel mainly conveys activated human capital, while the joint channel conveys both activated human capital and social capital, it is reasonable to assume that the use of the joint channel leads to higher reservation wage than that of the formal channel; namely $RW_J > RW_F$. As reservation wage is indirectly indicated by the number of job search attempts and obtained wage, we hypothesize that other covariates being equal, the link between contact use and reservation wage is causal when:

Hypothesis 1: Joint channel users make more attempts than formal channel users before a job offer is accepted. And

Hypothesis 2: Joint channel users obtain higher wages than formal channel users.

The second set is between Group I and Group J, comparing informal channel users' reservation wage (RW_I) with joint channel users' reservation wage (RW_J), as shown in Part 2 of Fig. 2. Since the use of formal job search strategies indicates human capital activated in a search process, we posit that joint channel users, who combine the use of formal and informal strategies to search for jobs, possess more human capital than informal channel users, who rely on contact use to get jobs. The comparison between these two groups of contact users is thus able to test whether or not contact use leads to a higher level of reservation wage for job seekers with a higher level of human capital (Group J) than for job seekers with a lower level of human capital (Group I); namely, $RW_J > RW_I$. Because social capital is highly correlated with human capital, the result of this comparison serves as the evidence for a causal effect of social capital on reservation wage, dependent on human capital. Given that job search attempts and obtained wage are proxy measures of unobservable reservation wage, we hypothesize that other covariates being equal,

Hypothesis 3: Joint channel users make more attempts than informal channel users before a job offer is accepted. And,

Hypothesis 4: Joint channel users obtain higher wages than informal channel users.

4. Data, measurements, and methods

4.1. Data

Data used in this study were drawn from the 2003 CGSS (Chinese General Social Survey), a nationally representative sample survey of urban China (Bian and Li 2012). Job search behaviour in China's transitional context is the closest to the multiple-method sequential search model, making it possible to test the causal link between contact use and reservation wage by using the number of search attempts as a proxy measure. Due to the job assignment system in the socialist regime and its long-lasting legacy during marketization, searching for multiple jobs at the same time was not common in Chinese society, at least during the years covered by the 2003 CGSS. The majority of the labour force would start a job search process targeting one particular position. A resourceful job seeker would employ all possible means – formal and informal included – in order to maximize the chance of successfully getting the job (Bian et al., 2015), and only move to the next targeted position when the previous attempt fails. Individual job search behaviour has changed significantly as the market economy was fully established in urban China. We thus refrain from using survey datasets from more recent years. Certainly, it is possible to test our hypotheses by using other available datasets, particularly in Eastern European countries that have also experienced fundamental socioeconomic changes (Chen and Volker 2016).

The 2003 CGSS consists of 5894 adult urbanites, 18–69 years old, randomly selected through a stratified probability sampling strategy. Detailed information on contact use for one's entry or mobility into the last job by the time of the survey was collected. For convenience, we term the respondent's last job the "current job." This dataset included contact use in job searches across a 44-year span from 1956 to 2003, in which Chinese economy transformed from state redistribution under Mao to a globalized market in the Deng and post-Deng eras. The wide-ranging institutional context of contact use in this dataset benefits the robustness of the causality test. A subset of 5054 respondents who worked full-time at any point in their job history was used in the analysis.

4.2. Job search channels

Each respondent was asked to report all methods used to get their current job. The informal channel was defined as contact use only, referring to assistance (information, recommendations, or other help) from relatives, friends, or acquaintances, and excluding any formal application procedure. The formal channel was defined as using formal job search methods only, such as job assignment by authorities, direct applications, job ads, and employment services. Respondents whose reported search methods fell into both the informal and formal categories were coded as using the joint channel. Subsequently, three user groups were identified: 66% (3335 cases) were formal channel users, 9% (455 cases) informal channel users, and 25% (1264 cases) joint channel users.

4.3. Number of job search attempts

The number of job search attempts was measured by the number of jobs one actively applied for prior to entry into the current job. Respondents who were assigned jobs by authorities were considered to have made one attempt. The sample distribution shows that about 91% of the respondents made only one attempt, around

4% two attempts, 2.5% three attempts, and another 2.5% four or more attempts. This distribution well indicates the long-lasting dominance of the state-controlled employment system in urban China, and makes the 2003 CGSS one of the very few survey datasets that strongly resemble the multiple-method sequential job search model.

4.4. Wage income of the current job

We chose the most recent income over income in the job-entry year. One reason is that entry-level income may not entirely reflect economic returns to job search behaviour, because not only the absolute amount, but also the growth rate of entry-level earnings matters (Corcoran et al., 1980; Boisot and Child 1996; Simon and Warner 1992). The other reason is, as Granovetter (1995:153) pointed out, that "using contacts may result in a 'snowball' process of advantage where contacts in one job lead to better contacts in another job" (see also Mouw 2003:878). We therefore used the 2002 annual wage income as the dependent variable. After a logarithmic transformation, the distribution of logged income was approximately normal with a mean value of 8.12 and standard deviation of 2.78.

4.5. Human capital, social capital, and control variables

Human capital was measured by years of education. Following previous studies (see Lin's review, 1999), we measured social capital by type of help from the reported key contact and homophonous characteristics between the individual and key contact. Following earlier social capital studies in Chinese society (Bian, 1997; Bian et al., 2015), we constructed "help of key contact" as a three-group categorical variable, with "no key contact" coded 0 (no identifiable key contact), "information" coded 1, and "influence" coded 2. Among 1719 contact users, about 30.5% did not identify any key contact, 24% reported information as most crucial, and about 45.5% reported influence as the main function of their key contacts. We also measured socioeconomic similarities between the job seeker and key contact, including whether or not the key contact worked in the same type of sector with the respondent (0 = no key contact; 1 = same sector; 2 = different sector), and whether or not the key contact shared the same managerial level with the respondent (0 = no key contact; 1 = same managerial level; 2 = contact at a higher level; 3 = contact at a lower level).

Control variables included age and its quadratic term (coded by years), gender (1 = female; 0 = male), Communist party membership (1 = party member; 0 = non-party member), years of work experience, family status origin indicated by father's highest year of education and father's party membership[1] (1 = party member; 0 = non-party member), and era of job entry by following Bian's (2008) classification (1 = before 1979; 2 = between 1980 and 1992; 3 = between 1993 and 1999; and 4 = between 2000 and 2003). In models used to estimate the recent logged income, we replaced "work experience prior to current job" with total years of work experience up to 2002. We also included sector type as an additional control variable, as China's labour market was divided by sectors, not occupations, during the observed years (Shen and Kogan, 2017). We identified five different sector types (0 = state-owned enterprises; 1 = government offices; 2 = collective enterprises; 3 = private firms; and 4 = others), in China's hybrid economic system. Detailed descriptive statistics are presented in Table 1.

4.6. Methods

We compare joint channel users with formal and informal channel users, respectively. Poisson regression was used to test Hypotheses 1 and 3 about the effect of contact use on the num-

Table 1
Descriptive Statistics, 2003 CGSS.

	Observations	Mean or percentage	Std. Dev.
Logged income	4688	8.12	2.78
Age	5053	26.54	9.31
Age square	5053	790.82	603.26
Education	5054	10.17	3.03
Father's education	5054	6.34	4.50
Previous work experience	5042	6.25	9.08
Previous work experience square		121.55	259.29
Total work experience	5053	17.28	12.37
Total work experience square	5053	451.47	533.32
Type of help			
No key contact	525	30.54	
Information	414	24.08	
Influence	780	45.38	
Homophily traits (sector and managerial level)			
Sector unspecified	778	45.23	
Same sector	658	38.23	
Different sector	283	16.46	
Level unspecified	778	45.26	
Same level	312	18.15	
Contact higher	567	32.98	
Contact lower	62	3.61	
Gender			
Male	2586	51.17	
Female	2468	48.83	
Party membership			
Party members	525	10.60	
Non-party members	4429	89.40	
Father's party membership			
Party members	1231	25.24	
Non-party members	3647	74.76	
Type of sector			
SOEs	2170	44.10	
Governmental departments	1024	20.81	
Collective	550	11.18	
Private/hybrid	1044	21.22	
Others	133	2.70	
Era of job entry			
1956–1979	1503	29.74	
1980–1992	1745	34.53	
1993–1999	1037	20.52	
2000–2003	768	15.20	

Table 2
Poisson estimation on the number of job search attempts and OLS estimations on obtained income, between joint and formal channel users, 2003 CGSS.

	Search attempts		Obtained income (baseline)	Obtained income (interaction)
Joint vs. formal	0.267	***	−0.110	−0.871*
	(0.021)		(0.114)	(0.396)
Personal qualities				
Education	0.007	**	0.107***	0.089***
	(0.003)		(0.016)	(0.017)
Joint*education				0.074*
				(0.034)
Work experience	−0.006	*	0.009	0.009
	(0.003)		(0.035)	(0.035)
Work experience square	0.000	+	0.001	0.001
	(0.000)		(0.001)	(0.001)
Family status origin				
Father's education	0.003	+	0.052***	0.052***
	(0.002)		(0.011)	(0.011)
Joint*father's education				
Father's party membership	−0.022		0.209*	0.203*
	(0.020)		(0.103)	(0.103)
Joint*father's party membership				
Control variables				
Age	0.016	*	0.051+	0.048+
	(0.006)		(0.027)	(0.027)
Age square	−0.000	**	−0.000	−0.000
	(0.000)		(0.000)	(0.000)
Female	−0.043	*	−0.9***	−0.899***
	(0.017)		(0.095)	(0.095)
Party membership	−0.057	**	0.142	0.147
	(0.019)		(0.123)	(0.123)
Period of job entry (ref: 1956–1979)				
1980–1992	0.024		−0.321	−0.311
	(0.017)		(0.208)	(0.208)
1993–1999	0.108	***	0.399	0.396
	(0.024)		(0.389)	(0.388)
2000–2003	0.306	***	0.107	0.096
	(0.034)		(0.513)	(0.513)
Type of workplace (ref: SOEs)				
Governmental departments			0.833***	0.851***
			(0.101)	(0.101)
Collective			−0.679***	−0.668***
			(0.197)	(0.197)
Private			0.057	0.072
			(0.156)	(0.156)
Others			0.456*	0.462*
			(0.204)	(0.201)
Constant	−0.234	*	5.642***	5.851***
	(0.095)		(0.752)	(0.755)
Observations	4358		3966	3966
Log pseudo-likelihood	−4812			
R-squared			0.120	0.122

Robust standard errors are in parentheses. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

ber of job search attempts. We adopted the Endogenous Switching Regression (ESR) model, in addition to the OLS, to test Hypotheses 2 and 4 about the effect of contact use on obtained wage. By estimating one selection equation and two outcome equations simultaneously, the ESR model makes two estimations, one with a random-selection constraint and the other without it. The self-selection effect can be identified by comparing these two estimations. A significant self-selection effect would occur when the error term in the selection equation is endogenous to the error term(s) in one or both outcome equations. An OLS model is feasible only when the self-selection effect is not significant. The ESR model does not impose particular restrictions on each observational case, so that the whole sample can be used in the analysis. This is an additional advantage relative to the first-difference estimation, which can only include respondents who used contacts at all observational times (Chen and Volker 2016). More details about the ESR model can be seen in Gamoran and Mare (1989) and Mare and Winship (1988).

5. Results

5.1. The causal effect of social capital independent of human capital

The first column in Table 2 presents the Poisson regression model on the number of job search attempts prior to entry into the current job. Other covariates being equal, the use of the joint channel increases the probability of making one more job search attempt by 31% ($e^{0.267}$-1), compared to the use of the formal channel. Hypothesis 1 is thus demonstrated. The results also indicate that every one-year increase in education increases one's probability of making one more attempt by about 1% ($e^{0.007}$-1). Every one-year increase in work experience decreases the chance of making a new job search attempt by 1% (1- $e^{-0.006}$). Women are, on average, 4% (1-$e^{-0.043}$) less likely than men to make one more attempt for job search, and party members are 6% (1-$e^{-0.057}$) less likely than non-party members to make one more attempt. Era of job entry strongly impacts the number of job search attempts made. Compared to job entrants before marketization, individuals who entered their jobs in the 1993-99 and 2000–03 periods are 11% ($e^{0.108}$-1) and 36% ($e^{0.306}$-1) more likely to make one more search attempt, respectively. This confirms the direct consequence of marketization on individual job search behaviour.

To test Hypothesis 2, we first constructed an ESR model. The model did not show a significant self-selection effect among either joint channel users or formal channel users (the results are not shown but are available upon request). As a result, the OLS regression was used with confidence. In columns 2 and 3 of Table 2, the baseline and interaction OLS models are presented. The baseline model shows that after covariates[2] are controlled, the use of the joint channel does not have a significant effect on obtained wage. This appears to indicate no difference in job search outcomes between the use of the joint channel and that of the formal channel.

The interaction model presents more complicated patterns on the meditating role of education in the relationship between contact use and obtained income. In this model, the main effect of the joint channel is significantly negative, meaning that the wage obtained through the joint channel is 58% ($1-e^{-0.871}$) lower than the wage obtained through the formal channel, other covariates being equal. The interaction between the job search channel used and education is significantly positive, meaning that every one-year increase in education increases the wage gain through the joint channel by 8% ($e^{0.074}-1$). These coefficients together show that the threshold for education to counteract the disadvantage in wage gain by using the joint channel is twelve years (equivalent to the level of high school) ($0.074*12-0.871 \approx 0$). In other words, individuals with less than high school education are better off to use the formal channel in job searches. For individuals with education above high school, the use of the joint channel would benefit their wage gain. Therefore, at the same educational level, the well-educated fare significantly better if they use the joint channel, rather than the formal channel alone, to search for jobs. This is the direct evidence in strong support of Hypothesis 2. The tests of Hypotheses 1 and 2 together confirm that the joint channel leads to a higher reservation wage than the formal channel.

5.2. The causal effect of social capital dependent on human capital

Table 3 presents the Poisson model on the number of job search attempts prior to entry into the current job. After homophily traits of social contacts and other covariates are controlled, the use of the joint channel increases one's chance of making one more job search attempt by 24% ($e^{0.216}-1$), as compared to the use of the informal channel. Hypothesis 3 is thus substantiated. In addition, as compared to those without using social contacts, job seekers getting information from their key contacts have a 12% ($e^{0.115}-1$) higher probability of making more search attempts, and, with marginal significance, job seekers getting influence from their key contacts have a 11% ($e^{0.104}-1$) higher probability of making more search attempts. These findings indicate that in the transitional context of Chinese society, both information and influence job seekers get from contacts are likely to raise their reservation wage, consequently leading to more job search attempts in a sequential search process.

To test Hypothesis 4, we also started with an ESR model. We found a significant self-selection effect among the joint-channel users in the ESR model. The ESR estimation was thus preferred over the OLS model. Based on the ESR estimations (shown in Table A1), we followed the decomposition method used by Gamoran and Mare (1989) and Gerber (2000) to show the expected logged wage with the self-selection effect taken into account.

As shown in Table 4, Panel A presents the wage difference caused by the use of different job search channels. Predicted wage obtained through the joint channel is significantly higher than that obtained through the informal channel (9.195 vs. 6.422). Panel B presents whether or not a self-selection effect exists, and if so, how it biases estimations on the job search channel effect. Based on the self-selection indicator ρ (shown in Table A1), no significant self-selection effect is found among informal channel users (B2 and B4

Table 3
Poisson estimation on the number of job search attempts, between joint and informal channel users, 2003 CGSS.

Predictors	Poisson Model on Number of Job Attempts
Joint vs. informal	0.216 (0.035) ***
Type of help (ref: no key contact)	
Information	0.115 (0.052) *
Influence	0.104 (0.055) +
Homophily traits	
Different sector	−0.035 (0.059)
Sector unspecified[a]	0.062 (0.055)
Contact higher level	−0.010 (0.048)
Contact lower level[b]	0.106 (0.114)
Personal qualities	
Education	0.006 (0.007)
Work experience	−0.008 (0.007)
Work experience square	0.000 (0.000)
Family status origin	
Father's education	0.007 (0.004)
Father's party membership	−0.019 (0.040)
Control variables	
Age	0.032 (0.013) *
Age square	−0.001 (0.000) ***
Female	−0.094 (0.035) **
Party membership	−0.081 (0.054)
Era of job entry (ref: 1956–1979)	
1980–1992	0.114 (0.046) *
1993–1999	0.228 (0.052) ***
2000–2003	0.428 (0.058) ***
Constant	−0.502 (0.197) *
Log pseudolikelihood	−1987
Observations	1625

Robust standard errors are in parentheses.
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, +$p < 0.1$.

are italicised to indicate non-significant self-selection effects). A significant self-selection effect is found among joint channel users, causing the average obtained wage among *observed* joint-channel users to be 82% ($=1-e^{(7.484-9.195)}$) lower than what a joint-channel user is expected to gain, if the choice between using the joint channel and the informal channel is randomly made. In a hypothetical scenario, where the group of *observed* informal channel users had used the joint channel, their expected income would have been much higher than what they actually obtained through the informal channel (12.588 vs. 6.422).

These results show that individuals who *are able to* use the joint channel are much more competitive job seekers in the labour market. However, there is a significant tendency for them to avoid using the joint channel, and instead, actively rely on the informal channel to get jobs. To a significant degree, thus, their wage gain observed through the informal channel should be attributed to their personal qualities, rather than the use of the informal channel itself. In short, when joint and informal channel users are predicted based on personal qualities, joint channel users are much more resourceful than informal channel users, which means a higher reservation wage among the former than the latter. This pattern is further shown by Panel C, which presents total logged wage after combining both effects of the search channel and self-selection. Panel C indicates that informal channel users would increase their wage gain greatly had they used the joint channel (C3 = 12.588). The observed average wage for joint channel users is significantly lower than what a joint channel user is able to gain (C1 = 7.484). In short, with self-selection effect taken into account, Hypothesis 4 is demonstrated. Findings in support of Hypotheses 3 and 4, together, show that reservation wage is higher among individuals who are able to combine contact use with formal job search strategies than those who solely rely on contact use.

Table 4
Decomposition of expected obtained income (logged) between joint and informal channel users, 2003 CGSS.

X=	
A. Difference caused by the job search channel	
$\quad \Sigma b_{1k}x_k$, the joint channel	9.195
$\quad \Sigma \beta_{2k}x_k$, the informal channel	6.422
B. Selection effects	
$\quad$1. $\sigma_{13}\lambda_1$, joint–channel users, actually using the joint channel	−1.711
$\quad$2. $\sigma_{23}\lambda_2$, informal-channel users, actually using the informal channel	*0.517*
$\quad$3. $\sigma_{13}\lambda_2$, informal-channel users, hypothetically using the joint channel	6.166
$\quad$4. $\sigma_{23}\lambda_1$, joint-channel users, hypothetically using the informal channel	*−3.058*
C. Total expected (logged) income	
$\quad$1. $E(Y_{1i}\vert Z_i < 0)$, joint-channel users, actually using the joint channel	7.484
$\quad$2. $E(Y_{2i}\vert Z_i < 0)$, informal-channel users, actually using the informal channel	*6.939*
$\quad$3. $E(Y_{2i}\vert Z_i < 0)$, informal-channel users, hypothetically using the joint channel	12.588
$\quad$4. *$E(Y_{1i}\vert Z_i < 0)$, joint-channel users, hypothetically using the informal channel*	*6.137*

Note: Italics represent coefficient decompositions based on non-significant error covariances.
Calculations are based on Table A1 in Appendix.

6. Conclusions and discussion

The literature has identified two sources of endogeneity, each presenting a challenge to the causal effect of social capital on job search outcomes. One source of endogeneity is homophily, the tendency of job seekers to socialize with highly similar contacts. Previous studies have addressed this issue of endogeneity and demonstrated the existence of the causal effect of social capital on finding high-status and/or high-paying jobs. However, previous studies have rarely discussed the other source of endogeneity, reservation wage, which is unobservable in an individual's job search process. The endogenous challenge imposed by reservation wage could have directly been solved had data sets with complete job-history information been available. Unfortunately, currently available job search surveys collect data only about successful job acquisition, and do not contain any information about rejected wage offers. Based on data with truncated wage information, we have developed an innovative strategy to establish the causal relationship between contact use and reservation wage. This strategy is based on the recognition of three groups of job seekers: Users of the formal channel, users of the informal channel, and users of both the formal and informal channels.

Our causality test consists of two sets of comparisons. The first set is between joint channel users and formal channel users. Our findings show that the use of the joint channel leads to more job search attempts. Meanwhile, for individuals with more education, the use of the joint channel also leads to a higher wage than that of the formal channel. These two findings together demonstrate higher reservation wage resulting from using the joint channel rather than the formal channel. Since human capital is controlled in model estimations, the only cause of higher reservation wage among joint channel users lies in social capital activated through contact use.

The second set of comparisons is between joint channel users and informal channel users. We find that joint channel users are significantly likely to make more job search attempts than informal channel users, and they also obtain higher income after controlling for both human capital and self-selection effect. The self-selection effect, as shown in our analysis (Table 4), is found among those who possess personal qualities suited to become joint channel users. There is a significant tendency for this group of theoretically predicted joint channel users to avoid using the joint channel, and actively choose to use the informal channel, instead. Consequently, observed informal-channel users would have enjoyed a much higher wage gain had they used the joint channel; on the other hand, the observed average wage for joint channel users in

reality is much lower than the predicted effect of the joint channel on obtained wage, had all individuals possessing qualities to become joint channel users adopted the joint channel to get jobs. In short, job seekers who are able to combine contact use with formal job search strategies possess more competitive personal qualities, and thus hold a higher reservation wage than those who only rely on contact use. Therefore, social capital contributes to the increase in reservation wage, dependent on human capital.

We must point out that the testing strategy of causality illustrated by this study is solely based on the sequential search model, which assumes that a job seeker employs all possible channels to search jobs one by one. This assumption precludes the possibility of a job seeker being exposed to multiple jobs simultaneously and then selecting the offer with the highest wage (Mouw 2003; Stigler 1961). In order to test the role of social capital in this kind of extensive search model, information about how each offer was obtained and evaluated by the job seeker is required. Collecting this type of information may lead job search studies to a new direction in future research.

Nevertheless, this study contributes to the general social capital literature in two respects. By using the ESR model, we are able to show the effect of the joint channel on income by singling out the confounding effect due to self-selection, and thus provide a new solution to endogeneity resulting from the homophonous nature of social capital. A more significant contribution of this study, however, lies in solving endogeneity due to reservation wage. With a focus on the joint channel, we confirm that social capital plays a positive, causal role in labour market outcomes, whether social capital being independent of or dependent upon human capital. This is why social capital is of great importance in one's labour market success.

Notes

1. Political screening was essential for the state-controlled job assignment system. A candidate's family background would be scrutinized before job assignment. It would be nearly impossible for those whose parents were not preferred by the Communist Party to get desirable assigned jobs. More details can be seen in *Studies in the History of Ideas: The Formation of Important Modern Chinese Political Terms (in Chinese)*, by Jin and Liu (2008). Research Centre for Contemporary Chinese Culture Special Issue (9). Available at http://www.cuhk.edu.hk/ics/rcccc/publish/pub_thoughts_main_ideas.html. Because family background is mainly characterized by father's status in Chinese society, in our analyses we only considered father's socioeconomic characteristics.

2. The number of job search attempts is not controlled in wage models, because following our argument, the use of the job search channel explains variations in both the number of search attempts and obtained wage. With the use of the job search channel included in the model, the number of search attempts should not have any significant effect on obtained wage. This has been confirmed by trial model estimations. Relevant results are not shown in the text, but are available upon request.

Funding

Declaration of conflicting interests

The Authors declare that there is no conflict of interest.

Appendix A.

See Table A1.

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Table A1
Endogenous Switching Regression of Recent Logged Annual Income between the Joint Channel and the Informal Channel, 2003 CGSS.

Independent variables	Selection equation		Outcome equations			
	Probit model		Formal-informal joint channel		Informal channel only	
Type of help						
Information	−0.427 (0.098)	***	0.516 (0.269)	+	−0.552 (0.678)	
Influence	−0.324 (0.100)	***	0.391 (0.274)		−0.505 (0.652)	
Homophily traits						
Different sector	0.031 (0.104)		0.100 (0.311)		−0.196 (0.553)	
Sector unspecified[a]	−0.006 (0.099)		0.210 (0.296)		−0.266 (1.175)	
Contact higher level	−0.208 (0.087)	*	0.979 (0.258)	***	0.939 (0.502)	+
Contact lower level[b]	−0.076 (0.193)		0.608 (0.568)		0.734 (1.175)	
Personal qualities						
Education	0.002 (0.011)		0.085 (0.034)	*	0.193 (0.076)	*
Work experience	−0.010 (0.021)		0.008 (0.061)		0.131 (0.123)	
Work experience square	0.000 (0.000)		0.000 (0.001)		−0.003 (0.002)	
Control variables						
Age	0.004 (0.019)		0.027 (0.054)		−0.031 (0.102)	
Age square	−0.000 (0.000)		−0.000 (0.001)		0.001 (0.002)	
Female	0.010 (0.062)		−0.550 (0.179)	**	−1.853 (0.392)	***
Party membership			0.278 (0.334)		0.054 (0.851)	
Era of job entry (ref: 1956–1979)						
1980–1992	−0.041 (0.156)		0.245 (0.448)		−2.057 (1.053)	+
1993–1999	−0.359 (0.244)		1.093 (0.704)		−0.505 (1.519)	
2000–2003	−0.446 (0.316)		0.986 (0.923)		0.211 (1.965)	
Type of workplace (ref: State-owned enterprises)						
Governmental departments	−0.076 (0.092)		0.428 (0.265)		−0.423 (0.583)	
Collective	−0.092 (0.100)		0.081 (0.296)		−0.519 (0.577)	
Private	0.097 (0.090)		0.178 (0.261)		−0.426 (0.510)	
Others	−0.174 (0.165)		0.32 6 (0.491)		1.451 (1.001)	
Family status origin						
Father's education	0.011 (0.004)	*				
Father's party membership	0.088 (0.045)	+				
Intercept	0.957 (0.483)	*	6.283 (1.415)	***	5.751 (3.339)	+
$\rho 1$ (=$\sigma 13/\sigma 1$)	−0.997 (0.001)	**				
$\rho 2$ (=$\sigma 23/\sigma 2$)	−0.196 (0.241)					
Observations	1461					
Log-likelihood	−4125.95					
LR test of outcome equations Chi-square (df = 1)	823.79					

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