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FINANCE AND ENTERPRISE PERFORMANCE: DOES ETHNICITY MAKE A DIFFERENCE?*

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Abstract

Using 2004-2007 firm-level micro data for enterprises in Xinjiang Uygur Autonomous Region of China, we investigate the relative importance of bank loans and trade credit in promoting enterprise performance. We find statistical evidence that access to bank loans plays a significant role in improving enterprise productivity, but it has a significantly negative impact on profitability; the result continues to hold when taking into account the ethnicity effect. Moreover, there is no evidence of an ethnicity gap for the effect of receiving bank loans on enterprise performance. We also cannot find strong evidence that trade credit influences productivity or profitability.

Keywords: bank loans, trade credit, enterprise performance, ethnic enterprise, Han enterprise
JEL Classification Codes: G32, O17

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I. *Introduction*

A growing body of evidence demonstrates that a well-developed financial system can influence enterprises' real activities and improve enterprise performance (Fazzari et al., 1988; Demirgüç-Kunt and Maksimovic, 1998; Nickell and Nicolitsas, 1999). However, in developing countries, the vast majority of formal financial systems are characterized by a high degree of control by public authorities (Germidis et al., 1991). Consequently, small and young enterprises are likely to be excluded from formal finance streams, such as bank finance (Cull et al., 2009). China provides an ideal setting to study the relationship between finance and enterprise performance. Although China's private sector has been served by an inadequate financial system, the sector has achieved explosive growth in the past three decades. Allen et al. (2005) attribute this "puzzle" to alternative financing channels, for example, trade credit, rather than formal financing channels. A number of empirical studies have confirmed the role of trade credit as an informal financing channel in developing economies where formal financing systems are undeveloped (McMillan and Woodruff, 1999; Demirgüç-Kunt and Maksimovic, 2001; Fisman and Love, 2003).

More recently, new literature has emerged on the relative importance of bank loans and trade credit in promoting enterprise performance. Evidence is rather mixed. Ge and Qiu (2007) suggest that China's non-state-owned firms use trade credit more extensively for financing purposes. Cull et al. (2009) find that trade credit is likely to provide alternative finance for customers of private enterprises and that state-owned enterprises (SOEs) redistribute bank loans to their customer enterprises in the form of trade credit. However, the authors argue that trade credit does not work effectively in China. Yano and Shiraishi (2012) investigate the efficiency of financial intermediation through trade credit in China using panel data over the period 1999-2006. They find that financial intermediation through trade credit is more efficient than bank loans; furthermore, their analysis shows that trade credit is more helpful for financing medium-sized enterprises. In contrast, using cross-sectional data of Chinese enterprises in 2002, Du et al. (2012) argue that access to bank loans is central to improving enterprise performance, while the availability of trade credit is much less important.

In this study, we focus on one of China's five province-level minority autonomous regions, the Xinjiang Uygur Autonomous Region (Xinjiang, hereafter) and compare the efficiency of bank loans and trade credit in promoting enterprise performance using a panel of 837 enterprises over the period 2004-2007. Xinjiang is a typical ethnic minority area in China that experiences conflicts between the ethnic majority (Han) and minority groups similar to Tibet. Sound and sustainable economic development there, if successful, can be a development model for multi-ethnic areas and economies subject to ethnic conflicts and the resultant stagnant economic development. A financial system is a crucial point for development, and therefore this study pays particular attention to it. Generally, China's ethnic minority areas are less developed than locations the Han people dominate, so it is more difficult for enterprises in ethnic areas to obtain external finance (Yang, 2006). We particularly seek to investigate whether an increased availability of bank loans or trade credit can improve enterprise performance in these underdeveloped areas.

Many scholars have explored the economic situation of China's ethnic areas. While the bulk of empirical studies have used household data (Gustafsson and Li, 2003; Sato and Ding,

2012; Li and Ding, 2013), very few have analyzed enterprises' activities. Generally, enterprises in ethnic areas are divided into two groups according to the ethnicity of the owner or manager: ethnic enterprises and Han enterprises. Sun and Hu (2013) focus on the relation between trade credit and enterprise productivity in China's Tujia ethnic area, and find that ethnic enterprises obtain lower returns from trade credit than Han enterprises. In this study, we also pay attention to the potential influence of entrepreneurs' ethnicity on the availability of bank loans and trade credit. Thus, our second question is whether an ethnicity gap exists when evaluating the effect of receiving finance on enterprise performance.

Meaningful comparisons of ethnic minorities and Han Chinese can reasonably be made in Xinjiang because the majority of the non-Han residents belong to culturally related groups (Hannum and Xie, 1998). More than 60% of China's Muslims reside in Xinjiang, including Uygurs, Kazaks, and Hui. By the end of 2011, Xinjiang's total population of 22.1 million consisted primarily of the Uygur (47%), and the Han Chinese (38.2%). The Uygur and Han people comprise the two largest groups in Xinjiang. The Kazaks and Hui ranked third and fourth, accounting for 7% and 4.5%, respectively.[1] Thus, we take Xinjiang as our case of an ethnic minority area in China. This enables us to make comparisons not only for ethnic minorities and Han Chinese, but also for Muslims and non-Muslim co-residents.

From our system generalized method of moments (GMM) estimation, we find statistical evidence that in Xinjiang the formal financing channel, bank loans, plays a significant role in improving enterprise productivity, but it has a significantly negative impact on profitability. This may be due to the mismatch between an enterprise's operations capability and marketing capability. Moreover, there is no evidence of an ethnicity gap for the effect of receiving bank finance on enterprise performance. We also cannot find strong evidence that trade credit influences enterprise productivity or profitability.

Our first contribution is that we distinguish ethnic enterprises from Han enterprises and investigate the influence of entrepreneur's ethnicity on financing activities of the enterprise. Second, this work provides valuable findings for the different influence of bank loans on enterprise productivity and profitability, for which we try to give an explanation from management science.

The remainder of the paper is organized as follows: Section 2 explains the empirical models and estimation methodology; Section 3 describes the data and includes some descriptive statistics; Section 4 presents our main empirical results; and Section 5 contains conclusions.

II. *Empirical Model and Estimation Methodology*

To investigate the influence of bank loans and trade credit on enterprise performance, we first use the following basic equation:

$$y_{it}=\alpha_0+\alpha_1 Bank_{it}+\alpha_2 TC_{it}+\gamma X_{it}+v_i+v_j+v_t+v_r+\varepsilon_{it} \quad (1)$$

where y_{it} indicates enterprise i's performance at time t. To measure enterprise performance, we use the logarithm of firm-level total factor productivity (TFP)[2], and return on assets (ROA),

[1] Data source: *Xinjiang China, 2012*. Xinjiang Uygur Autonomous Region Statistical Bureau edited. Urumqi: Xinjiang Scientific and Technical Publishers.

which is measured by the ratio of net profits to total assets. α_0 is a constant term, and α_1, α_2, and γ are the coefficients to be estimated.

$Bank_{it}$ denotes bank loans received by the enterprise. This term has been widely used in previous studies of financial development and economic growth (Levine, 2005). However, our dataset does not provide information on the quantity of bank loans enterprises received. Therefore, we follow the example of other authors such as Cull et al. (2009) and construct a proxy for the use of bank loans equal to interest payments divided by total assets. TC_{it} represents trade credit received from supplier enterprises. We use accounts payable scaled by total assets to assess the receipt of trade credit.

X_{it} is a vector of control variables and represents the enterprise's characteristics. The first control variable is the *Ownership* dummy variable. Enterprise ownership has often been found to have an effect on the productivity and profitability of Chinese enterprises (Zhang et al., 2002). Our dataset contains information on the fraction of paid-in capital different types of investors contribute each year: the state, collective investors, legal entities, individuals, investors from Hong Kong, Macao, and Taiwan, and foreign investors. As in Ding et al. (2013), we group investors from Hong Kong, Macao, Taiwan, and other parts of the world into a single category labeled foreign. Legal entities share is a mixture of ownership by state legal entities and private legal entities. The available information of state-holding share enables us to divide legal entities into state-owned and private. We then classify enterprises into SOEs, collective, private, and foreign, according to their largest ownership share (see Cull et al., 2009, for a similar approach). For instance, an enterprise with 40% state ownership, 30% collective ownership, and 30% private ownership is classified as an SOE. SOEs are the benchmark in our empirical model. The control variables also include the *Size* variable, which is measured by the logarithm of employment, and *Age* variable. Similarly, many researchers have found enterprise size and age to be related to enterprise productivity and profitability (Majumdar, 1997; Palangkaraya et al., 2009).

The error term in equation (1) has four components: ν_i is the firm-specific effect, which we control for by estimating the first-differenced equation of empirical models; ν_j is the industry-specific effect, which we take into account for industry characteristics by including ten two-digit industry dummies; ν_t is the time-specific effect, which we control for by including year dummies; ν_r is the region-specific effect and is taken into account by including region dummies.[3] Region dummies are included to control for different economic environments, such as infrastructure, the degree of commercialization, and financial policy, which are likely to affect the local enterprise's performance. Finally, ε_{it} is an idiosyncratic error term. By estimating the equation above, we examine whether the availability of bank loans or trade credit affects enterprise performance.

In this study, we also pay attention to the potential influence of entrepreneurs' ethnicity on the availability of bank loans and trade credit. Thus, we then conduct the following estimators,

[2] We obtain consistent estimates of TFP at the firm level using the semi-parametric method developed by Olley and Pakes (1996), which is fully described in Appendix 1.

[3] The 15 regions are: Urumqi City, Karamay City, Shihezi City, Bayangol Mongol Autonomous Prefecture, Bortala Mongol Autonomous Prefecture, Changji Hui Autonomous Prefecture, Ili Kazak Autonomous Prefecture, Kizilsu Kirgiz Autonomous Prefecture, Altay Administrative Offices, Aksu Administrative Offices, Hami [Kumul] Administrative Offices, Hotan Administrative Offices, Kashgar [Kaxgar] Administrative Offices, Tacheng [Tarbagatai] Administrative Offices, and Turpan Administrative Offices.

which include the interacted terms of the ethnicity dummy, bank loans, and trade credit variables:

$$y_{it}=\alpha_0+(\alpha_{11}+\alpha_{12}D_{ethnicity})*Bank_{it}+(\alpha_{21}+\alpha_{22}D_{ethnicity})*TC_{it}+\gamma X_{it}+v_i+v_j+v_t+v_r+\varepsilon_{it} \quad (2)$$

where $D_{ethnicity}$ denotes the ethnicity dummy. Here we use two methods to measure ethnicity: $D_{ethnicity1,\ i}$, which takes a value of one for all sample periods for enterprise i if the enterprise's owner or manager is an ethnic minority in one year at least during the sample period (time-invariant); $D_{ethnicity2,\ it}$, which takes a value of one only for the sample period, when the owner or manager of enterprise i is an ethnic minority (time-variant). α_{11} (or α_{21}) is assumed to capture the influence on the enterprise's performance when bank loans (or trade credit) are received by the enterprise. α_{12} (or α_{22}) is assumed to show the difference between ethnic enterprises and Han enterprises in respect of the influence of the receipt of bank loans (or trade credit).

When estimating equations (1) and (2), we use the system GMM estimator developed by Arellano and Bond (1991) and Blundell and Bond (1998), which combines regression in first-differences with regression in levels.[4] The system estimator enables us to address possible endogeneity problems in empirical models and the weak instrument problem in the simple first-differenced GMM. We treat *Bank*, *TC*, and *Size* as endogenous variables. Thus, for the first-differenced equations, two- or further- period lagged levels of endogenous variables are used as instrumental variables in addition to the first-differenced *Age* and year dummies used as exogenous variables. For the estimation of level equations, one-period lagged differences of endogenous variables are used as instrumental variables in addition to other variables and a constant as exogenous variables.[5]

It is important to stress that consistency of the GMM estimator crucially depends on the validity of the instruments, which requires that the pure error term ε_{it} be serially uncorrelated. In general, we check for serial correlation of order n in levels by looking for the correlation of order $n+1$ in differences (Roodman, 2009). We assess the presence of n^{th} -order serial correlation of the differenced residuals by using the $m\,(n)$ test, which is asymptotically distributed as a standard normal under the null of no serial correlation. If the null hypothesis is rejected, the instrument set for the first-differenced equation needs to be restricted to lags $n+1$ and deeper (Brown and Petersen, 2009).[6] In addition, the Hansen or Sargan test of overidentifying restrictions can also be used for testing the joint validity of the instruments. However, we use the Hansen test in this study since the Sargan test statistic is not robust to heteroscedasticity.

III. *Data and Descriptive Statistics*

Our data are drawn from the annual accounting reports filed by industrial enterprises with

[4] We use a two-step GMM estimator since it is asymptotically more efficient compared to a one-step GMM.

[5] The one-period lagged differences of endogenous variables Z are defined as follows: $\Delta Z_{it-1}=Z_{it-1}-Z_{it-2}$.

[6] The results of the *m(n)* test allow us to use two (and deeper) lags of the regressors as instruments for the first-differenced equation in all our specifications. Thus, we only report the *m2* test for second order serial correlation of the differenced residuals in our tables.

the Chinese National Bureau of Statistics (NBS) over the period 2004-2007.[7] All industrial enterprises with annual sales of more than five million RMB are covered (enterprises above the designated size, "Guimoyishang qiye"). We use the data for the enterprises located in Xinjiang which are directly obtained from the local NBS, and take Xinjiang as our case. The NBS data contain the information about owners or managers of enterprises. The unique ethnic composition in Xinjiang enables us to distinguish most ethnic enterprises from Han enterprises directly by the names of the enterprises' owners or managers.[8] We also obtain ethnic information for enterprises from the list of members of the People's Congress, as successful entrepreneurs generally are elected to the People's Congress.

Enterprises that do not have complete records on our main regression variables, as well as those with negative values of main regression variables such as bank loans and trade credit, are dropped. We eliminate enterprises with less than ten employees. We also drop enterprises with less than three consecutive years of data. This is because at least two-period lagged levels of variables are used to construct the instruments for system GMM estimation for regression in levels and regression in differences, as explained in Section 2. Finally, the unbalanced panel covering 837 enterprises with 3,017 firm-year observations is obtained for our empirical analysis.

Table 1 presents the descriptive statistics for the whole sample. We find that the occupation ratio of ethnic enterprises in our firm-year observations is less than six percent. Ethnic minority entrepreneurs are in charge of only a small portion of enterprises in Xinjiang, indicating wide disparity between Han Chinese and ethnic minority groups regarding their economic and business activities.[9]

Table 2 presents descriptive statistics for enterprises owned by Han Chinese and ethnic minorities, respectively. The t tests show that the mean values of $ln\,(TFP)$ and Age are significantly different across the two groups of firm-years. Han enterprises are much more productive than ethnic enterprises. They are also younger. With regard to the ownership dummy variables, Han enterprises possess more collective and private investors than ethnic enterprises, while ethnic enterprises are controlled mainly by the state capital. However, there is no significant difference in the receipt of bank loans or trade credit between these two groups of firm-years.

It should be noted that ethnic enterprises funded by private capital are significantly less than that of Han enterprises. This seems to suggest that ethnic minorities face more difficulty to establish enterprise. Onishi (2012) conducts interviews for ethnic entrepreneurs who established enterprises in Xinjiang and finds some common characteristics of these ethnic entrepreneurs: they can speak Mandarin Chinese; they value communication with people of other ethnic groups; and they generally graduate from university. However, Xu and Li (2009) find that the average education years of Uygurs, Kazaks, and Hui (the three largest ethnic minority groups in

[7] The original sample period is 1998-2008; however, the data for accounts payable are available only for the period after 2003, and the data for most variables are missing for 2008. Thus, the sample period is 2004-2007 in system GMM estimation.

[8] We can only use this method to distinguish ethnic enterprises from Han enterprises in Xinjiang and Tibet of China, because the ethnic minorities in these two regions have significant ethnic differences from Han Chinese. The other ethnic minority areas cannot satisfy the conditions.

[9] We should notice that Han Chinese make up only 38.2% of Xinjiang's total population, while the ethnic minority comprises the remaining 61.8% (See Section I).

TABLE 1. DESCRIPTIVE STATISTICS FOR THE WHOLE SAMPLE: 837 ENTERPRISES FOR THE PERIOD 2004-2007

Variable	Mean	Std. Dev.	Obs. No.
Dependent variables			
ln (TFP)	2.844	1.278	3,017
ROA	0.065	0.145	3,017
Independent variables			
Bank	0.013	0.015	3,017
TC	0.136	0.165	3,017
Size	4.931	1.251	3,017
Age	14.398	13.685	3,017
$D_{ethnicity1}$	0.059	0.235	3,017
$D_{ethnicity1}$*Bank	0.001	0.005	3,017
$D_{ethnicity1}$*TC	0.009	0.067	3,017
$D_{ethnicity2}$	0.049	0.216	3,017
$D_{ethnicity2}$*Bank	0.001	0.004	3,017
$D_{ethnicity2}$*TC	0.008	0.062	3,017
Ownership dummy variables			
SOEs	0.417	0.493	3,017
Collective	0.126	0.332	3,017
Private	0.433	0.496	3,017
Foreign	0.025	0.156	3,017
Industry dummy variables	available	available	3,017
Year dummy variables	available	available	3,017
Region dummy variables	available	available	3,017

Xinjiang) are less than the national average, and that of Han Chinese. Moreover, although bilingual education has been implemented for a long time in Xinjiang, a small number of ethnic minorities are proficient in Mandarin Chinese owing to language culture and poorly prepared teachers to some extent (Kormondy, 2012). The lower education level and language barrier of ethnic minorities might constitute obstacles to foster more ethnic entrepreneurs there. As a result, ethnic minorities are more likely to work in SOEs which generally have a relatively long history and are labeled as low efficiency in literatures (e.g. Zhang et al., 2002).

IV. *Estimation Results*

1. Basic Results

The estimation results of equation (1) are presented in Table 3. Estimates using *ln (TFP)* as the dependent variable are presented in columns 1 to 3, while columns 4 to 6 report results using *ROA* as the performance variable. For any specification, the Hansen test cannot be rejected at the five percent level, indicating that the instrumental variables used for the estimations are exogenous. Furthermore, our results for the *m(2)* tests also cannot detect serial correlation of ε_{it} for any specification. These results confirm the validity of the instrumental variables.

Columns 1 to 3 show that bank finance is significantly and positively associated with productivity. This finding is consistent with that of Ayyagari et al. (2010), who also find

TABLE 2. DESCRIPTIVE STATISTICS FOR ENTERPRISES OWNED BY DIFFERENT ETHNIC GROUPS[a]

	$D_{ethnicity1}$			$D_{ethnicity2}$		
	=0	=1	Diff.	=0	=1	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)
ln (TFP)	2.882 (1.262)	2.224 (1.385)	0.000***	2.879 (1.259)	2.162 (1.450)	0.000***
ROA	0.066 (0.143)	0.055 (0.179)	0.420	0.065 (0.143)	0.064 (0.189)	0.930
Bank	0.013 (0.015)	0.013 (0.015)	0.772	0.013 (0.015)	0.012 (0.015)	0.429
TC	0.135 (0.160)	0.161 (0.230)	0.139	0.135 (0.161)	0.162 (0.235)	0.169
Size	4.931 (1.245)	4.936 (1.341)	0.960	4.935 (1.247)	4.856 (1.334)	0.451
Age	14.112 (13.605)	18.983 (14.178)	0.000***	14.112 (13.600)	19.953 (14.190)	0.000***
Ownership dummy						
SOEs	0.403 (0.491)	0.633 (0.483)	0.000***	0.407 (0.491)	0.595 (0.493)	0.000***
Collective	0.130 (0.336)	0.062 (0.242)	0.001***	0.129 (0.335)	0.074 (0.263)	0.017**
Private	0.444 (0.497)	0.254 (0.437)	0.000***	0.441 (0.497)	0.270 (0.446)	0.000***
Foreign	0.023 (0.151)	0.051 (0.220)	0.102	0.023 (0.150)	0.061 (0.240)	0.060*
Obs. No. (%)	2,840 (94.1%)	177 (5.9%)		2,869 (95.1%)	148 (4.9%)	

Note: [a] This table reports sample means. Standard deviations are presented in parentheses. Diff. is the *p*-value of the *t*-test statistic for the equality of means.
* Significant at 10%. ** Significant at 5%. *** Significant at 1%.

evidence that bank finance plays a significant role in improving an enterprise's TFP. When we look at profitability in columns 4 to 6, we find that the coefficients for bank loans become significantly negative. This suggests formal financial channels have a negative association with enterprise profitability. This finding is completely contrary to Du et al. (2012), who observe a positive correlation between bank loans and ROA using a World Bank dataset. We will further explore the possible reasons in Section 4.2. For any specification, we observe that trade credit is negatively but not significantly associated with enterprise performance. Thus, there is no evidence that trade credit affects the enterprise performance we measure.

When we look at the control variables, we find larger enterprises and younger enterprises are more productive and more profitable. The fact that larger enterprises generate superior performance relative to their smaller counterparts is widely documented in the research literature (e.g., Bai et al., 2004). The negative association between an enterprise's age and performance can be explained considering that younger enterprises in China are typically more dynamic and more efficient than their older counterparts (Chen and Guariglia, 2013). Among the ownership dummy variables, the coefficients of all are positive and almost significant in all specifications, indicating SOEs' poor performance. China's SOEs generally have government support. In particular, they can often get "soft loans" from state banks and hence face a lower cost of capital than non-state enterprises. This might be the reason for their lower efficiency

TABLE 3. FINANCE AND ENTERPRISE PERFORMANCE: TWO-STEP GMM RESULTS FOR EQUATION (1)[a]

	Dep. var.=*ln (TFP)*			Dep. var.=*ROA*		
	(1)	(2)	(3)	(4)	(5)	(6)
Bank	11.738* (1.75)		12.397* (1.83)	-1.649 (-1.64)		-2.071** (-2.00)
TC		-0.871 (-1.02)	-0.636 (-0.82)		-0.046 (-0.50)	-0.044 (-0.44)
Size	0.586*** (5.86)	0.591*** (6. 21)	0.523*** (5.32)	0.043*** (3.88)	0.031*** (3.11)	0.040*** (3.54)
Age	-0.060*** (-18.15)	-0.060*** (-18.89)	-0.058*** (-17.78)	-0.001*** (-3.87)	-0.001*** (-3.22)	-0.001*** (-3.44)
Ownership dummy variables						
Collective	0.282** (2.52)	0.308*** (2.68)	0.277** (2.51)	0.020 (1.42)	0.019 (1.36)	0.021 (1.51)
Private	0.424*** (4.42)	0.405*** (4.27)	0.388*** (4.19)	0.028** (2.46)	0.028** (2.44)	0.029*** (2.58)
Foreign	0.440** (2.26)	0.329* (1.73)	0.379** (1.97)	0.086** (2.31)	0.083** (2.07)	0.082** (2.20)
Industry dummy variables	yes	yes	yes	yes	yes	yes
Year dummy variables	yes	yes	yes	yes	yes	yes
Region dummy variables	yes	yes	yes	yes	yes	yes
Constant	0.390 (0.83)	0.730 (1.44)	0.795 (1.62)	-0.153*** (-2.92)	-0.118** (-2.05)	-0.128** (-2.13)
P-value of Hansen test	0.593	0.254	0.516	0.391	0.108	0.148
P-value of m(2) test	0.295	0.050	0.231	0.497	0.533	0.556
Obs. No.	3,017	3,017	3,017	3,017	3,017	3,017

Note: [a] The table presents Blundell and Bond's two-step system GMM results. We report *z* statistics that are based on Windmeijer (2005)'s finite sample correction to the standard errors in two-step estimation.
* Significant at 10%. ** Significant at 5%. *** Significant at 1%.

levels in utilizing capital and lower rates of return on capital than non-state enterprises (Zhang et al., 2002).

In this study we pay particular attention to the effect of entrepreneurs' ethnicity on the availability of bank loans and trade credit. Thus, we conduct the estimators of equation (2), which include the interacted terms of the ethnicity dummy, bank loans, and trade credit variables. The estimation results are presented in Table 4. Estimates using $D_{ethnicity1}$ as the ethnicity dummy variable are presented in columns 1 and 2, while columns 3 and 4 report results using $D_{ethnicity2}$ for robustness check. In these cases we add the corresponding instruments for the interacted terms in the system GMM estimation. For all specifications, the Hansen test cannot be rejected at the five percent level and the results for the *m(2)* tests also cannot detect serial correlation of ε_{it}. These results confirm the validity of the instrumental variables we use.

Table 4 shows that bank loans have a significantly positive influence on the productivity of Han enterprises and has a significant and negative association with Han enterprises' profitability. Moreover, the insignificant coefficients of $D_{ethnicity}$ **Bank* suggest bank loans do not significantly vary in the returns to the performance of ethnic and Han enterprises.

For any specification, we observe that the coefficients for trade credit are not significant. So we are unable to confirm the exact influence of trade credit on the performance of Han enterprises. Column 4 shows that although fairly modest, we can find some significant

difference across the returns of trade credit to ROA. The returns from trade credit for ethnic enterprises are lower than for Han enterprises. Yano and Shiraishi (2013) find an ethnic bias against ethnic enterprises in receiving trade credit in Xinjiang, and ethnic enterprises there are less eager to build inter-enterprise trust with their business partners by offering trade credit than Han enterprises are. This might be the possible reason for ethnic enterprises' lower returns from trade credit.

TABLE 4. FINANCE AND ENTERPRISE PERFORMANCE: TWO-STEP GMM RESULTS FOR EQUATION (2)[a]

	$D_{ethnicity1}$		$D_{ethnicity2}$	
	Dep. var.=*ln (TFP)*	Dep. var.=*ROA*	Dep. var.=*ln (TFP)*	Dep. var.=*ROA*
	(1)	(2)	(3)	(4)
Bank	12.381*	-1.987*	12.837**	-2.256**
	(1.69)	(-1.84)	(2.01)	(-2.16)
$D_{ethnicity}$*Bank	-4.728	-1.891	-4.154	2.231
	(-0.23)	(-1.01)	(-0.28)	(0.74)
TC	-0.563	-0.008	-0.326	-0.004
	(-0.67)	(-0.07)	(-0.42)	(-0.04)
$D_{ethnicity}$* TC	-0.919	-0.171	-2.832	-0.370*
	(-0.35)	(-1.05)	(-1.09)	(-1.73)
Size	0.494***	0.041***	0.505***	0.039***
	(5.14)	(3.62)	(5.43)	(3.32)
Age	-0.057***	-0.001***	-0.057***	-0.001***
	(-16.98)	(-3.32)	(-17.71)	(-3.16)
Ownership dummy variables				
Collective	0.247**	0.019	0.250**	0.017
	(2.23)	(1.34)	(2.31)	(1.23)
Private	0.366***	0.028**	0.357***	0.025**
	(3.85)	(2.39)	(3.89)	(2.13)
Foreign	0.381**	0.083**	0.411**	0.083**
	(2.01)	(2.54)	(2.22)	(2.53)
Industry dummy variables	yes	yes	yes	yes
Year dummy variables	yes	yes	yes	yes
Region dummy variables	yes	yes	yes	yes
Constant	0.934*	-0.133**	0.851*	-0.118**
	(1.91)	(-2.22)	(1.83)	(-1.98)
P-value of Hansen test	0.507	0.521	0.707	0.406
P-value of m(2) test	0.247	0.537	0.327	0.405
Obs. No.	3,017	3,017	3,017	3,017

Note: [a] The table presents Blundell and Bond's two-step system GMM results. We report *z* statistics that are based on Windmeijer (2005)'s finite sample correction to the standard errors in two-step estimation.
* Significant at 10%. ** Significant at 5%. *** Significant at 1%.

2. The "Mismatch" between Operations Capability and Marketing Capability

Tables 3 and 4 show that bank loans have a significantly positive influence on enterprise productivity, but it also have a significant and negative association with enterprise profitability. We will further explore possible reasons in this section.

A lot of management science literatures stress the integration of marketing and operations

functions as key to enterprise performance (Balasubramanian and Bhardwaj, 2004; Ho and Zheng, 2004; Nath et al., 2010). A mismatch between these two functions leads to production inefficiency, whereas a proper fit leads to sustainable profits. Marketing capability is an important source of competitive advantage for enterprises. Specifically, sound marketing capability enables enterprises to meet customers' needs and translates into sales growth and profitability (Tsai and Shih, 2004). Operations capability is defined as the integration of a complex set of tasks performed by an enterprise to enhance its output through the most efficient use of its production capability, technology, and flow of materials (Nath et al., 2010).

In our case, with more bank loan receipts, the enterprise becomes more productive, but its profitability decreases. This suggests the possibility that the enterprise's operations capability is likely to be improved by obtaining bank loans for productive purposes; however, the enterprise's marketing capability does not catch up with the growth of operations capability. Thus, we propose a hypothesis for the reasons for bank finance's negative effect on enterprise profitability as follows:

Hypothesis: The "mismatch" between operations capability and marketing capability.

Intuitively, bank finance can lead to an increase in enterprise output; however, not all outputs translate into sales, and some are likely to still be kept by the enterprise in the form of inventory.[10] To test this hypothesis, we use finished goods of inventory as an instrument for bank finance and substitute it into equation (1). Accordingly, the first-stage regression is:

$$Inv_{it} = \alpha_0 + \alpha_1 Bank_{it} + \varepsilon_{it} \tag{3}$$

Where Inv_{it} denotes enterprise i's finished goods of inventory at time t, which is measured by finished goods divided by total assets. The second-stage regression, with the fitted values of Inv_{it} and residuals e_{it} obtained from equation (3), is as follows:

$$y_{it} = \alpha_0 + (\alpha_1 Inv_{it} + \alpha_2 e_{it}) + \alpha_3 TC_{it} + \gamma X_{it} + v_i + v_j + v_t + v_r + \varepsilon_{it} \tag{4}$$

The predicted Inv_{it} captures the effect of bank loans on finished goods of inventory, and if our hypothesis holds, the coefficient of $Bank_{it}$ will present as significantly positive. The residuals e_{it} capture the remaining effect of bank loans, for example, using bank loans for expanding the market. We also apply GMM estimation for the above equations. The regression results are reported in Table 5.

As shown in Panel B of Table 5, *Bank* is positively and significantly related to *Inv*. This suggests the availability of bank loans has a positive and statistically significant effect on finished goods of inventory. Panel A of Table 5 presents the results for the second-stage regression. *Inv* is significantly and positively associated with productivity and negatively related to profitability, while *e* presents positive coefficients but is not statistically significant in any specification. This indicates that bank finance significantly improves enterprise productivity; however, the outputs increasing correspondingly do not completely enter the market but just sleep in storage due to inadequate marketing capability. Thus, our hypothesis is proven true.

[10] Generally, the inventory is divided into raw materials, work in process, finished goods, stocks, etc. Finished goods are goods ready for sale to customs.

TABLE 5. TWO-STAGE REGRESSION[a]

	Dep. var.=*ln (TFP)*	Dep. var.=*ROA*
	(1)	(2)
Panel A	Second stage	
Inv	4.255*	-0.669*
	(1.67)	(-1.66)
e	1.485	0.325
	(0.98)	(1.48)
TC	-0.860	0.046
	(-1.05)	(0.42)
Size	0.532***	0.046***
	(5.60)	(3.90)
Age	-0.058***	-0.002***
	(-18.02)	(-3.64)
Ownership dummy variables		
Collective	0.274**	0.021
	(2.44)	(1.33)
Private	0.380***	0.027**
	(4.12)	(2.13)
Foreign	0.370*	0.089**
	(1.87)	(2.13)
Industry dummy variables	yes	yes
Year dummy variables	yes	yes
Region dummy variables	yes	yes
Constant	0.526	-0.143**
	(1.07)	(-2.13)
P-value of Hansen test	0.754	0.694
P-value of m(2) test	0.108	0.576
Obs. No.	3,017	3,017
Panel B	First stage: Dep. var.=*Inv*	
Bank	2.766**	2.766**
	(2.34)	(2.34)
Constant	0.057***	0.057***
	(3.89)	(3.89)
P-value of Hansen test	0.112	0.112
P-value of m(2) test	0.430	0.430
Obs. No.	3,017	3,017

Note: [a] The table presents Blundell and Bond's two-step system GMM results. We report *z* statistics that are based on Windmeijer (2005)'s finite sample correction to the standard errors in two-step estimation.
* Significant at 10%. ** Significant at 5%. *** Significant at 1%.

V. *Conclusion*

Using 2004-2007 firm-level micro data for enterprises in Xinjiang, we investigate the relative importance of bank loans and trade credit in promoting enterprise performance. First we examine the influence of bank loans and trade credit on enterprise performance and then examine their relationship when taking into account the ethnicity effect. The main findings are summarized as follows.

First, our analysis demonstrates that the formal financing channel, bank finance, plays a significant role in improving enterprise productivity. The results show that bank loans have a positive and statistically significant impact on enterprise productivity that is robust to the various controls, and still exert a positive influence when considering the ethnicity effect.

However, we find statistical evidence that bank finance has a significantly negative impact on profitability. This may be due to the mismatch between an enterprise's operations capability and marketing capability.

Second, we cannot find strong evidence that trade credit affects the enterprise performance we measure in terms of either productivity or profitability. When taking into account the ethnicity effect, we also cannot confirm the exact influence of trade credit on enterprise performance.

Finally, there is no evidence of an ethnicity gap for the effect of receiving bank finance on enterprise performance. The same amount of bank loans received does bring the same returns to ethnic enterprises and Han enterprises.

Overall, our findings suggest the need for further development of formal financial systems. Bank finance is of great significance in improving enterprise productivity. Since no difference has been detected in the effect of bank finance on performance between ethnic enterprises and Han enterprises, a bank lending policy of non-ethnic discrimination may benefit all enterprises in multi-ethnic areas. In addition, although production capability has a significant influence on enterprise performance, successful integration of functional capabilities is the key to an enterprise's sustainable growth. Our findings reveal the importance of enterprises enhancing their marketing capability. Careful deployment of resources on marketing activities such as advertising, sales personnel training, and customer relationship management is necessary to expand the market and translate production efficiency into profitability.

Appendix

Measure of Productivity

We obtain consistent estimates of TFP at firm level using the semi-parametric method developed by Olley and Pakes (1996, henceforth OP). For estimation purposes, we assume Cobb-Douglas technology:

$$\ln Y_{it}=\beta_0+\beta_1\ln L_{it}+\beta_2\ln K_{it}+\beta_3 Age_{it}+\mu_{it},\quad \mu_{it}=\omega_{it}+\eta_{it} \tag{A1}$$

where i and t denote the enterprise and time (year), respectively; Y_{it} is added value at 2004 fixed prices; L_{it} is the number of employees; K_{it} is the real original value of fixed assets; Age_{it} is the age of the enterprise since its establishment; ω_{it} is the productivity shock observed by the enterprise but not the econometrician; and η_{it} is an unexpected productivity shock that is unobserved by both the decision maker and econometrician. The nominal added value is deflated by the Producer Price Indices for Manufactured Goods by Region in the annual *China Statistical Yearbook* to measure real net output. The price deflator for the fixed assets investment is derived from Price Indices of Investment in Fixed Assets by Region in the *China Statistical Yearbook*, various years. Taking the 2004 index as the base price:

$$K_{it}=(1-d)K_{it-1}+[(NK_{it}-NK_{it-1})+dNK_{it-1}]/DE_{it},\quad \text{t=2005-2007} \tag{A2}$$

where d denotes the depreciation rate, assumed to be 5%, NK_{it} is the nominal original value of fixed assets, K_{it} is the deflated original value of fixed assets, and DE_{it} is the deflator for fixed assets investment. This calculation means that annual fixed assets investment is deflated to the real value and is added to the real original value of fixed assets in period t-1, already calculated, for the real original value of fixed assets in current period t. The nominal original value of fixed assets in 2004 is assumed to be the real

value.

Following the OP method, we use investment in fixed assets as a proxy for unobservable productivity:

$$I_{it}=K_{it}-(1-d)K_{it-1} \tag{A3}$$

In our sample, more than 91.2% of the observations include non-zero levels of investment, so the sample selection biases are considered to be modest. We further include the *exit* dummy variable to indicate the enterprise exited in the current period and zero otherwise.

Our estimation procedure is consistent with Yasar et al. (2008). We treat Age_{it} and lnK_{it} as state variables, lnL_{it} as freely variable inputs, and lnI_{it} as the proxy variable. The OP results are reported in Table A1.

TABLE A1. PRODUCTION FUNCTION ESTIMATES: OP ESTIMATION RESULTS.[a]

Variable	Dep. var.=*lnY*
lnK	0.303***
	(0.070)
lnL	0.501***
	(0.030)
Age	0.038
	(1.262)

Note: [a] The table presents regression coefficients. The standard errors are reported in parentheses.
*Significant at 10%. **Significant at 5%. ***Significant at 1%.

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