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Resource Curse or Destructive Creation in Transition Turmoil

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This paper explores the "resource curse" problem as a counter-example of creative performance and innovation by examining reliance on capital and physical resources, showing the gap between expectations and ex-post actual performance became clearer under conditions of economic turmoil. The analysis employs the method of logistic regressions with dichotomous response and predictor variables, on a count data sample containing 154 point derived from the transition economy of Vietnam. Performance of analysis has shown significant results. Several findings that have use for economic and business practice follow. First, in a transition period, a typical characteristic of successful firms was their reliance on either capital resources or physical asset endowments, whereas the innovation factor was not significant. Second, poor-performing enterprises exhibited evidence of over reliance on both capital and physical assets. Third, firms that relied on both types of resources tended to downplay creative performance. Fourth, reliance on capital/physical resources and adoption of "creative discipline/innovations" tend to be mutually exclusive. In fact, some evidence suggests that firms face more acute problem caused by the law of diminishing returns in troubled times. The Vietnamese corporate sector's addiction to resources may contribute to economic deterioration, through a downward spiral of lower efficiency leading to consumption of more resources. The "innovation factor" has not been tapped as a source of economic growth. The absence of innovations and creativity has made the notion of "resource curse" become identical to "destructive creation" implemented by ex-ante resource-rich firms, and worsened the problem of resource misallocation in transition turmoil.

Keywords: resource curse, transition economies, logistic regression, law of diminishing returns, destructive creation, rent-seeking

Introduction

Over-investments, using credit and equity, together with substantial physical asset endowments are a typical phenomenon that characterizes transition economies, especially those with communist ideology, such as Vietnam and China. In these transition economies, when there is threat to expected growth, the governments usually swiftly revert to the solution of expanding investments, by equity or debt. An example of that is when Chinese exports fell in the critical period 2008-2009 from 11% to 5% of GDP, its government reacted by substantially increasing the fixed-investment to GDP ratio from 42% to 47% (Roubini, 2011). In Vietnam, the

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problem of higher and increasing incremental capital to output ratio (or ICOR), around seven to eight, while typical Southeast Asian economies have ICOR of around three to four, is hardly a new thing. This Vietnamese higher ICOR represents the same propensity to over-invest in the domestic economy while the induced outputs are not necessarily showing positive changes in productivity and technological innovation (Pham & Vuong, 2009).

In this paper, we explore the effect of organizations' reliance on capital and physical resources in a transition economy, using data from Vietnamese firms. The notion of a "resource curse" (i.e., depending on too many resources after a long period of having too few resources) follows a period of growth and then decline in a country once regarded as the "next tiger" in Southeast Asia. To explore this question, we use Vietnam as an example of many transition economies that go through such a boom/bust cycle and the reactions that organizational leaders often follow, which becomes the resource curse. The research builds on previous conceptual research between creativity and entrepreneurship (Schumpeter, 1975; Napier, Dang, & Vuong, 2012; Vuong & Napier, 2012), and has four main parts: (1) a brief review of Vietnam's economy; (2) description of the empirical design; (3) results of the logistic regression; and (4) discussion on implications.

An Economy in Transition—Ups and Downs

Like other transition economies, Vietnam has had sweeping reform, known as "Doi Moi", which began in 1986. The country's economy grew rapidly from 1996-2000 (at 6.9% annual growth of GDP), accelerating to 7.5% p.a. in 2001-2005. During this fast growth, it consumed huge capital and physical assets, including for instance, ODA funding of $15 billion during 2001-2005 alone. In addition, Vietnam attracted an increasing stock of foreign direct investments (FDI), which amounted to more than 14,000 projects with nearly $210 billion committed by the end of 2012. The flood of foreign aid results in rent seeking activities where the involvement of politicians in power may lead to misallocation of resources as well as exclusion of other groups from the political process (Djankov, Montalvo, & Reyal-Querol, 2005). Perhaps the windfall of capital inflows does the same as well. As to the magnitudes, Djankov et al. (2005) even statistically prove that "aid is a bigger curse than oil".

Over time, however, Vietnam's emerging economy has appeared inefficient, wasting physical and capital resources as measured by the "Investment-to-GDP" ratio. This ratio has risen over three critical phases: 34.9% (1996-2000) to 39.1% (2001-2005) to 43.5% (2006-2010), meaning the country needed more scarce resources to finance growth. In addition, the economy consumed huge credit amounts. For example, the credit supply in 2010 was 13.7 times that of 2000, while GDP doubled in the same decade. Scarce physical assets (e.g., land, housing, mines) have likewise been used inefficiently by "special interest groups", including so called "crony capitalists", who have access to scarce resources and yet yield mediocre performance. The state-owned enterprises (SOEs), for instance, officially borrowed over $60 billion but created a total market equity value of only $33 billion (Vuong, 2012).

Other problems have emerged. Reliance on credit to finance growth has generated high inflation, peaking at 23% in 2008. Monetary policy tightened the market rate for credit to as high as 25% (Pham & Riedel, 2012). Further, from early 2011 to the end of 2012, over 100,000 (mostly private) enterprises declared insolvency or quietly closed operations, accounting for between 15%-25% of the enterprise population (Vuong, 2012).

Although monetary policy is critical, we argue that another solution for the Vietnamese economy may be more crucial, in particular entrepreneurship and creative performance (Napier et al., 2012; Vuong, Napier, &

Tran, 2013). In this paper, then, we expand those ideas empirically. In essence, we question whether reliance on capital and physical resources will suffice for yielding economic improvement (Vuong, 2007), without equivalent efforts on creative activity and performance.

Research Methods, Data, and Empirical Approach

Vuong and Napier (2012) proposed a paradigm for using a disciplined creative process to absorb and use information and insights before making decisions that generate innovations, and may be what the Vietnamese corporate sector and economy appear to miss (Vuong, 2007; Pham & Vuong, 2009). Vietnamese firms, relying more on chance opportunities, have tended to throw scarce capital and physical resources that have little chance of payoff instead of a careful disciplined creative process gearing toward innovations that produce market values, the waste of resources is understandable, highly likely and often very costly for firms and their stakeholders.

To examine whether, in a period of turmoil, Vietnamese firms do appear to rely on physical and capital resources in lieu of using creative processes, we examined debt-to-equity ratio, rate of asset size increase, severity of loss, and qualitative information over the real-world activities of firms with respect to creative performance—for instance, optimal solution on inventory management, and technical innovations. An earlier paper (Vuong & Napier, 2012) argued that without "creative quantum"—elements of creative energy for thinker and implementer, made of useful information, data and primitive insights on solutions needed—multiple filters, and a creative discipline in place, an increasing consumption of resources leads to wasted resources, lower efficiency, and diminishing returns. So a key question is what happens if reliance on capital and physical resources overwhelms emphasis on innovative outcomes?

To examine the question, we used categorical data analysis for count data, which were obtained from both qualitative and quantitative information. This analysis was logistic regression estimations for dichotomous response variables, and categorical predictor variables. A brief discussion of our statistical methods for research follows:

$$\ln\left(\frac{\pi}{1-\mu}\right) \quad = \text{logit}(\pi) = \beta_0 + \beta_i X_i^K, i = 1, \dots, K \tag{1}$$

In this model, π is to represent the success probability, that is $Y_i = 1$; and Y_i is the event we want to observe from the empirical data. β_0 is the intercept, and β_i coefficients associated with the i^{th} predictor variable, X_i.

The standard null hypothesis is $\beta_i = 0$, for each $i = 1, \dots, K$. For examining interactions between variables, the null hypothesis becomes $\beta_i \beta_j = 0$.

The likelihood ratio test statistic is employed for hypothesis testing using:

$$G^2 = -2\ln\left(\frac{L_0}{L_1}\right) = -2\ln(L_0 - L_1) \tag{2}$$

where L_0 is the numerical value of the likelihood function computed from the observed data using under the null hypothesis estimate (π), and L_1 under the empirical data-based estimate ($\hat{\pi}$). This G^2 test statistic follows a χ^2-distribution with *K* degrees of freedom (see Agresti, 2002 for a full account of technical treatment of logistic regression analysis).

The data set came from published reports and official information releases by companies listed on the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX). Out of the approximately 700

companies listed on these stock exchanges, we randomly selected 150. Other data sample came from companies that we have followed for quite some time. The data set has 154 data points in total.

For each data point, the following attributes are considered: (1) How efficiently does the firm operate in economic terms, e.g., making profits (end second quarter 2012 performance, compared to performance in the previous two quarters), suffering a loss, or approaching bankruptcy; (2) How much does the firm rely on equity and debt capital for growth, measured by comparing sales to total assets, and leverage ratio; (3) How much does the firm rely on physical assets, measured by reliance on access to land, mine/quarry, and related natural resources (whether these tangible resources are accounted for large portion of the firm's total assets and generate most of revenues); and (4) To what extent does the firm have innovation or creative solutions at work (whether new product, new service, new management process is reported). Due to the lag effect of investments (financial and physical) to business performance, reliance on resources was measured at the end of 2011 fiscal year.

All of these predictor variables are categorical, and since we identified only two values "Yes = 1" and "No = 0", this estimating model is dichotomous both with response and predictor variables. The treatment follows Azen and Walker's (2010) dummy coding. Tables 1 and 2 show the structure for the empirical data.

In both Table 1 and Table 2, Inn1 means "existence of innovation verified" and Inn0 means "not verified". "Yes" and "No" are confirmation of efficient firm performance as observed with our empirical data. Cap1 means "Heavy reliance on capital", Cap0 means "Not reliant" likewise As1 and As0 are "reliant on physical asset endowments" and "not reliant", respectively.

Table 1

Count Data on Well Performing Firms

			Cap1	Cap0
Yes	Inn1	As1	0	2
		As0	7	23
	Inn0	As1	1	4
		As0	1	16

Table 2

Count Data for Poor-Performing Firms

			Cap1	Cap0
No	Inn1	As1	0	0
		As0	0	0
	Inn0	As1	67	2
		As0	29	2

These two subsets of were used to learn more about the problem of reliance on resources versus the value of innovative production/solutions with respect to economic performance of companies. The results from logistic regressions follow.

Empirical Results

The following statistical estimations were performed with SAS. An exploration into the overall model fit was done by testing the global null hypothesis $H_0: \beta_1 = \beta_2 = \cdots = 0$ yielding corresponding likelihood ratio test statistic values, which reject the H_0.

The examination of the "success formula" that prevails in the transition economy of Vietnam is typically based upon the use of capital and physical resources. To verify this, the first two separate estimations look like:

$$\ln\left(\frac{\pi}{1-\mu}\right) = \beta_0 + \beta_1 X_1 \text{ and } \ln\left(\frac{\pi}{1-\mu}\right) = \beta_0 + \beta_2 X_2 \quad (3)$$

where X_1, X_2 are predictor variables "Capital" and "Asset", respectively. The reference categories for these two models are Cap = Cap0 and Asst = As0, in this order.

The estimation results are provided in Table 3.

Table 3

Results on Well Performing Firms, Innovation Excluded

Parameter	*df*	Std. Estimate	χ^2-Wald	*p*-Value
		$\text{logit}(\pi) = \beta_0 + \beta_1 X_1$		
Intercept	1	2.42	21.52	< 0.0001
Cap (Cap1)	1	-4.79	58.21	< 0.0001
		$\text{logit}(\pi) = \beta_0 + \beta_2 X2_1$		
Intercept	1	0.42	3.24	0.0721
Asst (As1)	1	-2.70	34.68	< 0.0001

Our estimations indicated strong reliance on either capital resources or ability to acquire physical resources within the surveyed sample of enterprises—with all χ^2-Wald scores showing strong significance at any conventional level, which have shown positive performance in the economy's troubled times. In the latter ($\text{logit}(\pi) = \beta_0 + \beta_2 X2_1$), intercept is weakly significant at 10% conventional level, with χ^2-Wald score being 3.24 and *p*-value at approximately 0.07. Thus, reliance on resources, either capital or physical, was found to be a decisive factor among somewhat stable and satisfactory corporate performers.

The above regression results suggest the contribution of the reliance on capital resources and physical assets. Then, the second specification that was examined had the form: $\text{logit}(\pi) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$. In this, a third dummy variable was introduced into the equation: the "innovation factor" with which "no innovation" is the reference category. The results are provided in Table 4.

Table 4

Results on Well Performing Firms, Innovation Included

Parameter	*df*	Std. Estimate	χ^2-Wald	*p*-Value
Intercept	1	1.99	8.92	0.0028
Cap (cap1)	1	-5.20	32.63	< 0.0001
Asst (as1)	1	-1.17	1.70	0.1916
Inno (inn1)	1	15.69	0.01	0.9348

The estimating of the above equation showed a substantial change in significance levels of all coefficients of dummy variables introduced into the model. Largest magnitude of coefficient belongs to "innovation" predictor variable, followed by "reliance on physical assets". Nonetheless, with a small numerical value for χ^2-Wald being 0.01 and 1.7, respectively, both coefficients are not statistically significant at conventional levels, suggesting that they do contribute to the meaningful explanation about positive performance of well-performing enterprises. The reliance on capital resource is overwhelming, although with small estimated

coefficient, presented by a large χ^2-Wald value of 32.6, and a *p*-value < 0.0001.

The next question was which factors would likely have strong impact on the performance of poor-performing enterprises in the sample data. The third specification is established to look into these, bearing the form:

$$\ln\left(\frac{\pi}{1-\mu}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 \quad (4)$$

where X_1, X_2 are predictor variables "Capital" and "Asset" respectively, with Capital = 0 and Asset = 0 serving as reference, giving two dummy variables—one for reliance on capital resource, the other for reliance on physical asset, when each answer is "Yes" and the response variable is corporate performance when their performance is recorded as "Negative".

Exploring the overall model fit was done by testing the global null hypothesis, yielding the likelihood ratio test statistic $G^2 = 125.5$ and χ^2-Wald of 44.1. Both test statistics follow a χ^2 with three degrees of freedom. Since critical value for $\chi^2_{(3)} = 11.3$, the global null hypothesis of no relationship is decisively rejected.

Regarding analysis of individual variable effects, "reliance on capital resources" showed a significant effect, with χ^2-Wald score (*df* = 1) being 26.5 (significant at any conventional level), while "reliance on physical asset" yielded a test score of 2.9, or statistically significant at 10% conventional level. Nonetheless, Wald $= 0.46$ supports $H_0: \beta_3 = 0$. Therefore, for better adjusting this specification, only effects of dummy-coded variables in the original specification should remain. That is, we should only rely on the following simple specification for gauging the effect of "capital resource" and "physical resource" on failures of corporate firms surveyed:

$$\ln\left(\frac{\pi}{1-\mu}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \quad (5)$$

Performing the adjusted model provides for results reported in Table 5. The numerical values of likelihood ratio and Wald statistic are almost identical to the previous estimation. However, estimates and significance of predictor variables in this simplified specification improve substantially, and are provided below.

Table 5

Results of MLE on Poor-Performing Firms, Innovation Excluded

Parameter	*df*	Std. Estimate	χ^2-Wald	*p*-Value	e^{β}
Intercept	1	-3.25	22.86	< 0.0001	0.04
Cap (Cap1)	1	4.62	41.82	< 0.0001	101.10
Asst (As1)	1	2.45	11.68	0.0006	11.55

Economic Implications and Further Discussion

The novelty of this paper is its exploration of the "resource curse" problem as a counter-example of previous discussions about creativity: by examining reliance on capital and physical resources, the gap between expectations and ex-post actual performance became clearer under conditions of economic turmoil. Indeed, the findings suggest that such reliance, in the absence of creative discipline could explain unsustainable performance of business operations, during chaotic years that are more typical in Vietnam's transition economy.

Several findings may have use for economic and business practice. First, in a transition period, a typical characteristic of successful Vietnamese firms was their reliance on either abundant capital resources or

favorable conditions tapping physical asset endowments, whereas the innovation factor was not significant. Second, poor-performing enterprises exhibited evidence of over reliance on both capital and physical assets. Third, firms that relied on both types of resources tended to downplay creative performance, exhibiting little or no effort to apply creative disciplines at work. Fourth, reliance on capital/physical resources and adoption of "creative discipline/innovations" tend to be mutually exclusive. In fact, some evidence suggests that firms face the law of diminishing returns in troubled times, when market conditions are unfavorable. Even if the economic environment improves, we might expect that firms relying on abundant endowments would, at least, have below-average performance as Sachs and Warner (1995) prove the negative relationship between resource abundance (measured by country's resource-based exports as a percent of GDP) and economic growth.

An explanation for the "resource curse"—or overreliance—could be the corporate sector's "destructive creation", where firms use abundant capital and physical assets to create various business operations outside of their core competency while ignoring the innovation factor as a way to improve productivity and/or introduce positive changes to their business operation and management. The trend of overusing capital and physical assets may be part of the corporate culture, in which firms have shown a clear trend of amassing resources both before and after their success.

When entrepreneurs aim at personal wealth accumulation instead of contribution to national economic prosperity and innovative pursuit, their relationship-based rent-seeking activities become rampant (Vuong & Tran, 2009). Then, most, if not all, entrepreneurial efforts become a race to capture as many resources as possible. Given the entrepreneur has a constant volume of energy there is almost nothing left for creative endeavor.

Business owners are often eager to join with acquirers, often called "strategic partners", as a way to cash in their start-up achievements and transform themselves from entrepreneurs into capitalists (Vuong et al., 2010). To this end, the entrepreneurs are less willing to create value but prefer to speculate in scarce resources, such as real estate business where lands are scarce or banking operations where money is scarce.

It is not only individuals but also business institutions that scramble for resources. With regard to Vietnam's corporate bond market in 1990-2010, Vuong and Tran (2011) also found that state-own enterprises and commercial banks, organizations that had already acquired huge volumes of resources—were the most active bond issuers dominating the market. In addition, major stock market players take advantage of well-known brands to obtain favorable working capital while the others are facing credit crunch. For example, the wood processing and real estate development Hoang Anh Gia Lai (HAG), which is a hot stock on the Vietnam Stock Market HOSE, enjoyed both physical resources (land and wood) and financial resources when it successfully issued 2-year bonds in 2008, which was at a time when other enterprises had difficulty in accessing commercial short-term credit (Vuong & Tran, 2011). In May 2012, HAG reported to shareholders it had a debt burden of US$750 million, or 63% of total assets. Vietnam's leaders also faced more trouble with the bankruptcy of the state-run shipbuilder Vinashin and mounting debts of loss-making SOEs, which reach over US$60 billion by the end of 2011.

The corporate sector's addiction to resources may contribute to economic deterioration, through a downward spiral of lower efficiency leading to consumption of more resources. On the other hand, the "innovation factor" has not been tapped as a source of economic growth in Vietnam's transition economy. The absence of innovations and creative performance has made the notion of "resource curse" become identical to "destructive creation" implemented by resource-rich privileged firms and related rent-seekers, and amplified

the adverse effect of misallocation of resources during a turbulent transition period.

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