Household Economic Transformation and Recent Fertility in Emerging Market Economies:
*China and Vietnam Compared**

Kim M. Korinek
Postdoctoral Fellow
Carolina Population Center
University of North Carolina, Chapel Hill

Feinian Chen
Assistant Professor
Department of Sociology
Texas A&M University

Soumya Alva
Study Director
Child and Family Study Area
Westat Inc.

Barbara Entwisle
Professor, Department of Sociology
Director, Carolina Population Center
University of North Carolina, Chapel Hill

Direct Correspondence to: Kim Korinek, Carolina Population Center, University of North Carolina, Chapel Hill, CB#8120, 123 West Franklin Street, Chapel Hill, NC, 27516-2524; email: korinek@email.unc.edu.

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What propels some households, rather than others, to change and adopt new forms of activity? This paper focuses on one possible factor—the event of a birth—in two societies that are transitioning from socialism to market economy: China and Vietnam. The influence of births and childrearing on women's labor force participation has been examined across a wide range of social contexts (Sweet 1973; Oppenheimer 1979; Mason and Palan 1981; Roos 1985; Desai and Waite 1991; Tiefenthaler 1997; Entwisle and Chen 2002; Short et al. 2002). Parallel work has yet to emerge that explores economic adjustment and transformation occurring at the level of the household following the birth of a child. This paper takes a comparative approach to exploring the longitudinal relationship between recent fertility and household economic activity. Our analyses, rooted in theories of household economy and family adaptive strategy, are concerned with the household as a collective, flexible unit and the nature of its dynamism over time. According to these theoretical perspectives, family size and composition are consequential for the creation of entrepreneurship and other adaptive strategies because each influences access to labor, human resources, social capital, and financial capital (Chayanov 1966; Tilly and Scott 1978; Hareven 1982).

The central question that we address in this paper is whether the birth of a child is an event that precipitates change in families' economic activities, such as adoption of entrepreneurial activity or diversification across economic sectors. Since the late 1970s, Chinese and Vietnamese households, once organized into command economy collectives, have grown increasingly salient as units of economic production, innovation and market participation (Judd 1994; Entwisle et al. 2000). China's swift adoption of the household responsibility system and decollectivization policies, beginning in 1978, and Vietnam's movement toward household-based agricultural production via a series of *doi moi* land laws and

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household business reforms beginning in the early 1980s, transferred the organization of agriculture and decision-making about production and labor from the state-directed, collective system into the domain of households (Fforde and deVylder 1996; Jacka 1997; Liljestrom et al. 1998). These dramatic policy shifts made peasant households into small-scale cultivators, facing "all the risks and opportunities that independent entrepreneurship entailed" (Chan et al. 1992, p. 271). In the context of these state policy changes, some households participated in and benefited from new patterns of economic activity, while others did not. Macro economic change arises in part through changes in the activities performed by units that constitute the economy.

The consequences of a birth for household economic activity is of particular interest in these settings given that market reform policies in both countries were closely followed by the imposition of state birth planning programs that limited couples' ability to choose how many children to have, and thus influenced the internal structure of their households. Drawing from three multi-wave household surveys conducted in Vietnam and China during the 1990s, we determine whether the addition of a child, or children, serves to either restrict or enrich the types of economic activity undertaken by households. Our research design also makes it possible to determine whether families with an abundance of young children are more or less likely than families with few children to adopt market-oriented economic activities, such as non-farm enterprises. Taken together, these analyses delineate the relationship between fertility and household economic activity and thereby provide insights into the logic of fertility limitation policies. By implementing a longitudinal, comparative research design that incorporates short-run changes in both household economic activity and changes to household composition brought about by the event of a birth, we recognize the integrated dynamism of household membership and household economic arrangements.

Furthermore, we directly compare households across Vietnam and China, and households located in rural and urban areas, allowing us to examine two dimensions of contextual variability in the effects of fertility on economic outcomes. Theoretical elaboration has occurred through the discovery of contextual

variability in the relationship between fertility and women's labor force participation. The geopolitical boundary separating China and Vietnam sets up an informative comparison by delineating two contexts with distinct, though parallel, historical experiences, cultural systems and geographic conditions within which household members formulate economic strategies (Summerfield 1997; Luong and Unger 1999). Because of their historical and cultural parallelisms (e.g., patriarchal family systems and preference for sons; focus on filial piety and ancestral worship; 20th century socialist revolutions; lingering rural poverty in the context of rapid economic growth), we can aggregate Chinese and Vietnamese households and make comparisons both within and across the two countries. Alongside the Vietnam-China comparison, our analyses also examine rural-urban contexts as they condition the relationship between recent births and subsequent household economic strategy. Residing in a rural versus urban place delineates a set of economic opportunities, traditions, and social milieu that are perhaps more salient to household demographic dynamics and resulting economic arrangements than are differences defined by Chinese and Vietnamese geopolitical space. In both China and Vietnam, rural dwellers face more pervasive poverty and a dearth of off-farm employment opportunities compared to urbanites. In addition, fertility levels are higher and extended family residence is more common in rural households as compared to their urban counterparts. Our analytical framework thus allows us to consider whether elements of 'ruralness' or 'urbanity' influence household economies in a manner that transcends national differences.

BACKGROUND

The occurrence of a birth is one potentially powerful event in the family life course whose impact upon household production activities and their coordination is not adequately understood. In the extensive literature on women's labor force participation it is commonly observed that individual women make adjustments to their work activity following a birth, and that their adjustments tend to be "conservative" (e.g., scaling back employment, shifting one's activities from the formal to the informal, household sector). If we shift our focus to the household—the operative economic unit in post-socialist

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China and Vietnam, and elsewhere in the developing world—we ask a different set of questions: do births facilitate economic adaptation by households? And, if so, do these adaptations move households in conservative or innovative directions?

To answer these questions we draw upon the family adaptive strategy construct, which asserts that families are flexible, active social participants that undertake adaptive responses to social structural constraints and life course events arising within their micro- and macro-level social contexts (Moen and Wethington 1992). The household, as a unit, is viewed as undertaking short-term or long-term activities that serve to consolidate or enhance members' economic situation; this takes place through the collectively-oriented allocation of work within the household, sending members out to work, pooling income, and other role and resource allocations (Tilly and Scott 1978; Hareven 1982; Moen and Wethington 1992). Existing scholarship on family adaptive strategy posits that work activities, among men and women and across generations, do not arise through choices independently made, but rather reflect coordinated arrangements informed by resource demands and power relations among household members (Tilly and Scott 1978; Elder 1999; Chen 2004). While a host of critical analyses have been aimed at the concept of family strategy, pointing to its often ambiguous and reified nature, and its tendency to blur the conflicts and uneven distribution of power among household and family members (Viazzo and Lynch 2002; Engelen 2002), a workable middle ground lies in the conceptualization of families as "cooperative conflict units" that may experience inner conflict and inequalities, yet at the same time feature coordinated activities and shared interest in individual members' wellbeing (Sen 1990; Summerfield 1997, p.202).

The framework of family adaptive strategies suggests that family members working together develop approaches to generate income in the face of economic difficulties or crises, and this combination of income and subsistence-generating work lessens the gap between family needs and available resources (Moen and Wethington 1992, p.235; Elder 1999). In less developed countries, where families face

innumerable challenges in attaining secure economic conditions, the birth of a child is a transformative event that may seriously alter the constellation of family needs, may potentially bring economic hardship, and thus may encourage newly configured economic activities. Given that the duties of childcare attract mothers and often other family members such as grandparents into the domestic sphere, it is increasingly likely that the household acts as a center of both social reproduction and economic production activity. Furthermore, since newborn babies pose additional demands upon household economic resources, rearrangements of labor activity may be made to accommodate these new and anticipated demands, not only by the newborn child's mother, but by the entire lot of family members. One need not hold a stringent view of households as completely cooperative and harmonious to assert that members besides the mother may change their economic activity following a birth, and that the aggregation of such individual adjustments may generate marked changes at the level of the household (Hareven 1982). In this paper, we hypothesize and verify empirically that it is not just mothers' production and reproduction activities that change following a birth, but change also occurs at the level of the entire household.

The family in Asia is characterized by coordinated systems of obligation and cooperation. Croll (2000, p.15) observes that for families, one of the most common aims of planning and building is, "the short and long-term reduction of risk and the maintenance of economic and social security of the family unit; to achieve these important ends families accumulate and divide resources, allocate roles, and distribute activities." Previous research demonstrates that in China, Vietnam, and other Asian societies, grandmothers and other family members play important roles as surrogate childcare providers so that new mothers, although the context and location of their work may change, often make little adjustment in their workforce participation (Desai and Jain 1994; Chen et al. 2000; Entwisle and Chen 2002). In response to a birth, older women and men in the household may experience "role enlargement," starting a business or expanding their activities across sectors so as to enhance economic security for the household as a whole (Chen 2004). These findings suggest that an incomplete picture emerges if we focus only upon changes

in mothers' work activities following a birth. Change is likely to occur in the work activities of other household members—including siblings, grandparents and other kin—in order to maintain the household's economic well-being. In this way, births, at least in the short-term, may propel households into innovative economic activity.

The nature of recent economic change and the place of households in the Chinese and Vietnamese economies makes the comparative analysis of household demographic change and household economy especially pertinent. In both contexts, similar market reform and family planning policies have brought sweeping changes to the society and economy since the late 1970s and mid 1980s. China's 1979 adoption of the household responsibility system and Vietnam's 1986 *doi moi* reform initiative asserted the primacy of households in each country's emerging market-oriented economy. In essence, these policy reforms wrested decision-making and control over labor and production from state-directed collectives and cooperatives and placed it squarely into the domain of the household. However, soon after households were handed the reins to plan and initiate economic activity, each country's government passed birth planning laws placed serious limits upon couples' ability to make decisions about fertility.

Taken together, the market reform and one- or two-child policies have engendered market reform situations in which the family-household is a central agent of economic development, yet while, "State control of production has lessened … control of reproduction has tightened" (Goodkind 1995; Gammeltoft 2001, p.266). While government rhetoric maintained that the restrictive birth planning policies were intended to manage population growth and foster the health of women and children, extensive critiques have been lofted against the state birth planning policies for threatening the status of women, human rights, and systems of production and old-age security in rural, peasant households (Davis and Harrell 1993; Greenhalgh 1993, 2001; Goodkind 1995). Despite the contentiousness of the birth planning policies, systematic research has yet to delineate the repercussions of births and the number of children borne by a couple for household economic strategy. By assessing the nature of short-term

change in economic activity in households recently experiencing a birth, and households with numerous young children, we gain valuable insights into the logic of birth planning policies and their consequences at the household level.

APPROACH

Using a comparative longitudinal design, we ask whether households with recent births and numerous children tend to be sites of economic innovation, or whether these households adopt relatively restricted, conservative economic activity patterns. In particular, we ask whether the recent incidence of a birth increases the odds that a household engages in entrepreneurial activity, diversifies across economic sectors, or participates in the wage sector. We also ask how each of these outcomes is influenced by the human capital, labor, and financial resources possessed by households and reflected in measures of household composition, educational attainment of members, and asset ownership or wealth of the household. In the market reform era, even more so than under the collective command economy, it is conceivable that having several children would expand the reach of households across diverse activities, whereas a family with just one or two children may remain relatively specialized. Diversification of economic activity across sectors has been shown to be an important strategy in poor, farming households' efforts to minimize risk (Lauby and Stark 1988; Entwisle et al. 2000). Likewise, the small and medium-sized enterprises central to the emerging private sector in both Vietnam and China commonly arise from family-based businesses (Ronnas 2001). Given that these frequently lauded activities emerge from the cooperative efforts of household members, we inquire whether the presence and birth of children serves to heighten or limit their occurrence.

To ask whether households with recent births are sites of innovative activity requires information about births and also about household economic activity and possible changes in it. We derive such information from three longitudinal surveys. We begin with a focused regional survey in northern Vietnam's Red River Delta, the Vietnam Longitudinal Survey (VLS), which collected data from a

stratified random sample of households in three core provinces of the Delta from 1995 to 1998. We then

extend to a survey that is nationally representative for all of Vietnam, the Vietnam Living Standards

Survey (VNLSS), which used a self-weighting stratified sample of households from Vietnam's seven

regions surveyed in 1992-93 and again in 1997-98. Finally, we incorporate the China Health and

Nutrition Survey (CHNS), which features a multistage cluster sample of households located in eight

regionally and economically diverse provinces of the People's Republic of China. It was conducted in

1989, 1991, 1993, 1997, and 2000. Data from 1993 and 1997 are used in the analyses reported here.

With these three longitudinal data sets, we ask whether a birth occurred between waves of the survey and

if so, whether household economic activities also changed over this same interval. Details on sampling

methodology, sample size and attrition, and the specifics of data collection are included in an appendix to

the paper.

Our approach is also comparative, reflecting an overarching question about the role of context;

that is, does the social and economic context prevailing in different transition and development contexts,

as represented by urban and rural China and Vietnam, condition the impact of births and household

composition upon household economic strategies? Households in China and Vietnam bear important

distinctions—in terms of nationality, geography, historical experience and socioeconomic conditions, and

similarities—in having been witness to and participants in the transition from socialism to market

economy, and subject to family policies that impose limitations on fertility (Luong and Unger 1999).

Vietnam and China have in common aspects of culture and historical experience that feature a patriarchal

social order and ethos. China and Vietnam also occupy similar positions on the international stage, each

having witnessed dramatic economic growth throughout the 1990s under hybrid market-socialist

economic systems (Haughton et al. 2001). Within both China and Vietnam the socioeconomic divide

between rural and urban households is so striking, and income inequalities are so stark, that it is fitting to

consider urban and rural dwellers as essentially two distinct populations (Yao 1999; Nguyen 2003).

Although each country's housing registration system has been modified since the market reforms, easing rural-to-urban mobility, and although many suburban villages have arisen that blur the rural-urban boundary, the distinction between rural and urban continues to define a pervasive line of socioeconomic differentiation.

To arrive at a comparative analytical design we collate the three data sets and create parallel measures for economic activity, household composition, wealth and resources at the household level. In each data set, household level variables are defined with reference to the individuals, both kin and nonkin, currently residing in the same dwelling unit.[1] We recognize that households have flexible, ambiguous boundaries that are difficult to delineate at times, and that both China and Vietnam have seen a growing share of their rural populations participate in large-scale labor migrations to cities and rural regions with relative labor scarcity (Dang, Goldstein and McNally 1997; Feng 2000). However, while our working definition may diverge from the formal definition (*hu*) utilized in registration systems, and from the kinship unit (*jia* or *gia dinh*), we believe that it adequately incorporates the usual participants in household-oriented economic and social reproduction tasks (Zhang 2000).

For each of the three data sets we develop measures of household-level economic activity based upon an aggregation of individual household members' work activities. We categorize information on each resident household member's occupation and employment context and then aggregate these activities to arrive at a classification of the household's economic profile at time one (1992-93 for the VNLSS, 1995 for the VLS, and 1993 for the CHNS) and time two (1997-8 for the VNLSS, 1998 for the VLS, and 1997 for the CHNS). The size of the analytical samples included in the VLS, VNLSS, and

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1. One exception to this approach arises with the VLS data on economic activity; whereas the VNLSS and CHNS inquire about all members' economic activity, the VLS only collected economic activity data for resident members age 15 to 65. Our belief is that the absence of economic activity data for children and elders over age 65 in the VLS overlooks a negligible number of cases of wage employment, diversification and business at the household level. We assess this assumption by determining whether economic activity profiles shift in Red River Delta households included in the VNLSS if we base our calculations only upon 15-65 year-old members. While youth below age 15 and elderly over age 65 do engage in economic activity, there were very few cases when the household typology

CHNS are 1,779, 4,300, and 2,277, respectively. A portion of households were lost to follow-up between rounds of data collection in each of the surveys. Following preliminary analyses of selectivities related to attrition (a summary is presented in the data appendix), we decided to limit our main longitudinal analyses to those households in the VLS, VNLSS and CHNS that are included in the two successive rounds of data collection.

We use logistic regression to model household economic activities in Vietnam and China. The multivariate analysis approach is illustrated by the following equation:

$$LN\ [\Pr\ (E_{ijt} = 1)] = aE_{ijt\text{-}1} + bB_{ijt} + cH_{ijt} + dW_{ijt} + eD_{ijt}$$

We model the log odds of the dependent variable, E_{ijt}, i.e., whether household i in community j engages in a certain type of economic activity or not at time t (t=1997-8 for the VNLSS, 1998 for the VLS, and 1997 for the CHNS). To arrive at the household-level measure, we begin by classifying household members' primary and secondary work activities (based upon work in the previous week) into the following sectors: 1) family agriculture, 2) non-farm family business, or 3) wage employment in the non-farm or farm sector[2]. Aggregating all resident household members' activities, we categorize households according to a three-way economic activity typology that allows for comparison across our three research settings and across the three-to-five year survey intervals.

Thus, household economic activity (*Eijt)* is measured in three ways in our analyses: whether the household is engaged in wage employment, household entrepreneurship, and/or multiple activities that span diverse economic sectors. Each of the household economic activity outcomes signifies a form of participation in the emerging market economy, as well as households' ability to undertake activities that may enhance survival chances and mobility opportunities. Households' breaking their reliance upon

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was altered as a result of censoring the work activity of very young and very old workers from the household aggregate.

[2]. The vast majority of wage employment in both countries is non-farm work. Wages may be earned in a state, collective, or private firm; in the Red River Delta the majority of wage employment occurs in the state sector, whereas wage-earning employees are more evenly distributed across the private and state sectors of South Vietnam and China.

agriculture and undertaking more diverse economic activities, including non-farm entrepreneurship, has contributed to declines in household poverty in Vietnam and China (Luong and Unger 1999). Household involvement in the wage sector is of interest because, while it often represents the most economically secure form of employment in the modern, formal sector, it is often deemed incompatible with maternal childcare and social reproduction duties. Besides demonstrating a relatively modern, market-orientation, the economic outcomes that we measure at the household level—diversification, non-farm entrepreneurship, and wage employment—are indicative of innovative household behavior. Innovation can be detected due to the longitudinal design, which assesses change in households' economic profiles over a three to five year interval, and thus makes it possible to highlight newly emergent economic activities.

We include five groups of independent variables in the model. First, we indicate whether the household had a family business, wage employment, or diversified economic profile in the previous round of data collection (E_{ijt-1}). Controlling for economic activity at $t-1$ (1992-93 for the VNLSS, 1995 for the VLS, and 1993 for the CHNS) essentially allows us to estimate the effect of our other independent variables on *changes* in households' economic activities over time.

Second, our focal independent variable (B_{ijt}) indicates whether a birth has recently occurred. We construct this variable by comparing household rosters over time to see whether any household members have been born between surveys at time t and $t-1$. We create a dummy variable for each household indicating whether one or more births have occurred over the survey interval, which ranges from three to five years. The incidence of two or more births over the survey interval was relatively infrequent, and thus we group multiple and singular births together in the dummy variable. We note that because different survey intervals are used across the three data sets, children born since the 1995 VLS survey can only be between zero and three years old in the 1998 survey, whereas children born between the VNLSS surveys could be between ages zero and five at the time of the next survey. We offer a caveat in

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interpreting the effects of a birth: in each setting the event of interest, a birth, did occur; however, the chances of this event occurring are slightly greater, and the average age of newborn children at time two is likely to be slightly older in the VNLSS and CHNS, as compared to the VLS, holding constant fertility rates and other family-level variables.

Third, we include measures of household composition (H_{ijt}). Data collection in the three surveys utilized household rosters to enumerate resident members, and to define the age, gender and other characteristics of each member. From these rosters we create a count of household members in the following categories: newborns since the last survey, children under age six, children age six to fourteen, young adults age 15 to 24, working-age adults age 25 to 59, and elder adults age 60 and older. This disaggregation of household members allows us to inquire about family structure influences on household economic outcomes. We address the impact of fertility upon household economic outcomes, vis-a-vis the birth planning policies, through variables which indicate the numeric presence of pre-school and school-age children. Gender divisions of labor within the household and the labor force, purported to have become more sharply divided in the post-socialist era (Honig and Hershatter 1988; Pham Van Bich 1999), are likely to influence household-level opportunities, such as securing wage labor and operating certain household businesses. Accordingly, our measures of household composition disaggregate young men and women (age 15-24) and working-age men and women (age 25-59), so as to assess whether features of household composition have consequences for household economic strategy that are differentiated by gender.

Finally, in order to capture the unique, independent effects of recent births and household composition upon changes in household economy, we introduce into the models a set of covariates that control for the level of wealth (W_{ijt}) and education resources (D_{ijt}) in the household. Our measure of education resources is a dummy variable indicating whether the household has one or more members with upper secondary schooling or higher. To measure household wealth, we use indicators of housing

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conditions and consumer durable ownership, including: whether the household has a flush toilet; whether the household has an earthen floor; whether the household owns a television; and whether the household owns motorized transport (i.e., most often a motorbike). Additionally, we construct an index for the household's aggregate asset ownership, weighted according to the number and approximate value of select household consumer durables owned by household members (notes on construction of the index are provided in the data appendix).

The elaboration and development of theory in the social sciences is often compromised by attempts to generate conclusions based upon research findings collated across studies that utilize different approaches to measurement, model estimation, and other research design elements. The formulation of concepts and principles is often muddled in the process of patching together related, yet disparate, findings. Our approach aggregates households in rural and urban areas of China and Vietnam and performs pooled, multinomial logistic regression analyses to estimate the impact of births upon economic arrangements. Thereby, it is possible to comment upon the degree of generalizability or specificity across social contexts in the relationship between recent fertility behavior and household economic activity. While heeding scholars' cautions on the cultural and methodological barriers to achieving true equivalence using comparative research and multinational surveys (e.g., Jowell 1998), we believe that the definitions and lines of questioning about household membership and economic activity are sufficiently similar across the VLS, VNLSS, and CHNS to permit construction of comparable conceptual measurements. By analyzing two neighboring countries that have experienced similar historical transitions in the late 20th century, drawing upon the authors' collective knowledge of the two countries, and focusing on a few relatively straightforward indicators (e.g., the number and gender of household members) we acknowledge the potential pitfalls that befall comparative design yet maintain that cross-national measurement and analysis is both practicable and constructive in this case.

RESULTS AND DISCUSSION

Table One presents a detailed version of the household economic activity typology, which compares households across research settings and over time. Comparing the incidence of entrepreneurship, diversification, and wage employment at times one and two reveals that the type of economic activity undertaken by Vietnamese and Chinese households is not static, but rather undergoes significant change over a relatively brief time period. Engaging in family business activity, solely or in combination with other activities, is much more common in Vietnamese households than in households of China, with urban households in the Red River Delta sample showing the highest levels of household entrepreneurship. However, trends in the data demonstrate that household entrepreneurship actually declined among Red River Delta households between 1995 and 1998, while in Chinese households analogous entrepreneurial activity increased, especially in urban areas. Wage earning is the converse to family business when comparing Chinese and Vietnamese households. While wage employment is far more common within Chinese households, the share of households with wage employment decreased in nearly every type of setting during the mid 1990s, and the decline was especially pronounced in urban China. While the particular sectoral combinations vary substantially, the incidence of household diversification is quite similar in the Red River Delta, Vietnam as a whole, and the Chinese provinces, with around 35-45% of households diversifying across multiple sectors. In each setting except rural Vietnam, household diversification was mostly stable over time or declined during the mid 1990s.

[Insert Table One about here]

Two patterns revealed in Vietnamese and Chinese household economies are especially relevant for our comparative study. First, we discern that rural-urban differences in household economic arrangements *within* China and Vietnam tend to be more distinct than the differences *between* Vietnam and China. Rural areas are characterized by a large percentage of households specialized in agricultural production, whereas urban households have large shares of households specialized in non-farm family business and wage work. Household diversification across economic sectors is typically more common in

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rural areas than urban areas. These patterns maintain in both Vietnam and China, suggesting that "rural-ness" and "urban-ness" are salient contextual differences that shape household economic strategies, and these contextual categories have commonalities that transcend national boundaries. We pursue this rural-urban versus Vietnam-China comparison more formally as we proceed through more complex household economic activity modeling. A second notable pattern that emerges in Table One is the marked degree of change observed in both Chinese and Vietnamese household economies during the mid-1990s. In neither context are household economic profiles static.

Bivariate data in Table Two suggest that in both China and Vietnam, household economic activity changed noticeably over the time period and the incidence of a birth helped to shape these changes. In the bivariate analyses the incidence of a birth is associated with two types of innovation in the household--diversification and operation of non-farm businesses. The first column, showing change in household diversification during the three to five year interval between surveys, demonstrates that in all settings, except the urban Red River Delta, households that have had a birth are also more likely to take on multiple activities that span economic sectors. That is, where diversification has declined overall, the decline is less steep in households with a birth, and where diversification has increased overall, the increase is more pronounced in households with a birth. A similar pattern emerges with respect to household entrepreneurship. Again we see that the incidence of a birth has a mostly positive effect on household business activity; the incidence of a birth either weakens the context-specific decline in household business activity, or it strengthens the increase in household business activity over time.

[Insert Table Two about here]

The picture of wage sector employment yields more mixed results. In the Red River Delta, wage employment declined in households during the mid-1990s and this decline was more precipitous in rural areas; however, the impact of a birth on declining wage employment appears to have been more pronounced in urban areas. The data for all Vietnamese households suggest that wage employment

increased between 1993 and 1998, and that this increase was stronger in households that had recently experienced a birth. In China, wage employment decreased in both urban and rural areas in the mid-1990s. The wage employment trend associated with recent births diverged across China's rural and urban areas. While rural households experiencing a birth in China actually saw an increase in wage sector involvement between 1993 and 1997, the opposite was true in urban settings, where households that experienced a birth disproportionately exited the wage sector.

In order to investigate in greater detail the influence of recent fertility and household composition changes upon household economic strategies, while simultaneously assessing the independent influence of other household composition and resource factors and aspects of regional and national context, we proceed to parallel multivariate analyses in the three research contexts and then to a pooled multivariate analysis that includes covariates indicating the rural-urban and country status of households. We first conduct, separately for the VLS, VNLSS, and CHNS, multivariate analyses that model household entrepreneurship, diversification across employment sectors, and wage employment. Given notable differences in employment opportunities, workplace organization, and living conditions, we model these outcomes separately for rural and urban areas. Since each of the dependent variables is discrete and binary we use a logistic regression model (represented in the equation on page nine). Where applicable, our analyses take into account sampling weights to adjust for oversampling of certain populations. Furthermore, since households are nested in villages for each research context, the models adjust the standard errors to account for clustering at the village/district level.

Because results from the six analyses are voluminous, we place the complete model results in the appendix (Tables A1-A3). Here we focus our discussion upon the impact of a birth on household economic strategies, calculating predicted probabilities for entrepreneurship, diversification, and wage sector engagement that characterize each rural-urban and country setting in order to portray the impact of a birth (Figures 2A-2C). The predicted probabilities graphed in the figures derive from multivariate

simulations that control simultaneously for all the model covariates (i.e., household composition, education and assets, and household economic activity) as measured at time one.

[Insert Figures 2A-2C about here]

Figure 2A displays the impact of a recent birth on the probability of non-farm business activity, suggesting that a birth in the past three to five years has a positive influence on the probability that a household starts a non-farm enterprise. To a varying degree, this positive relationship is observed in China and Vietnam, across both rural and urban settings. In urban households of Vietnam's Red River Delta and in urban China we observe that the influence of a recent birth on household entrepreneurship is positive and statistically significant. In the other, mostly rural, contexts the association between recent fertility and subsequent household entrepreneurial activity is positive, though the relationship does not achieve statistical significance. Comparing the model results for household entrepreneurship across contexts it appears that the relationship is more pronounced in urban areas. This suggests that the household demography-household economy relationship may be dependent upon rural-urban location.

Figure 2B graphs the predicted probabilities for household diversification that are associated with the impact of a recent birth. Again, the model results suggest that a recent birth has a positive influence on the likelihood of diversification across economic sectors. With the exception of urban Red River Delta households, this positive relationship is observed across each study setting. As was evident for household-based entrepreneurship, the multivariate models predicting diversification indicate that recent fertility is associated with innovation in the household economy—the formation of small non-farm business and combination of activities that span multiple economic sectors. At least for economic activity that emanates from the household sector, this is early evidence that births act as a positive inducement to novel and diversified activity that extends beyond the agriculture sector.

Figure 2C displays the predicted probabilities for involvement in the wage sector. Contrary to the results for household-based entrepreneurship and diversification, we observe that recent fertility lessens the probability that a household incorporates wage employment into its economic strategy. This result

generalizes to each study context, but the negative association is stronger for urban households. It is in urban households of the Red River Delta and China that we observe statistical significance in the negative association between recent fertility and household wage sector activity. These results, in combination with the predicted probabilities for entrepreneurship and diversification, suggest that if recent fertility does interfere with or deter household economic activity, this occurs mostly with respect to wage employment. It is significant that this negative relationship, which has been associated with maternal employment, emerges at the household level as well.

In order to adjudicate the significance of context for household economic activity, and to demonstrate whether national and rural-urban context conditions the relationship between recent fertility and change in household economic activity, we perform pooled analyses that include household observations for China, Vietnam and the Red River Delta. Having aggregated these households into a joint analytical sample, our method for determining whether the impact of fertility varies by setting is to derive and compare goodness-of-fit statistics across various additive and multiplicative models that include interaction terms for recent births and national setting, or for births and rural-urban setting. Specifically, we refer to the Bayesian Information Criterion (BIC) statistic and Wald chi-square statistic (which are appropriate under the conditions of robust cluster analyses), in order to identify which model (i.e., which additive model, or model with interaction terms) best fits the pooled household data. If adopting the Bayesian perspective, the model with the minimal BIC (i.e., the largest negative value) represents the most suitable model(Raftery 1995). However, if following the assumptions of the chi-square test statistic, the model with the largest value represents the best model. We utilize both model fitting statistics to assess the robustness of our model selection criterion. The superior model fit statistics will indicate whether the models with interaction terms provide additional information, and hence indicate whether there is a significant difference across settings in the relationship between household composition and household economic activity.

Goodness-of-fit statistics for the three models of household economic activity are compared in Table Three. The models associated with the fit statistics are shown in their entirety in Appendix Tables A4-A6. A comparison of the models reaffirms results from the separate country analyses—that household business activity is more likely in Vietnamese households, while the odds of diversification across sectors and wage employment are greater in Chinese households. Looking across the models for those with a relative improvement in the goodness-of-fit over the additive model suggests that recent births facilitate similar dynamics in the household economy, irrespective of national or rural-urban context. Comparing the five models for wage sector employment and sectoral diversification we see that models containing birth and household composition interactions with the country status variable have poorer fit with the data compared to the non-interacted models. Although goodness-of-fit statistics improve modestly when a country-birth interaction is added to the model predicting household business (Table A4, Model 4), the interaction term is not statistically significant, further suggesting that the influence of a birth upon changes in the household economy is quite similar in Vietnam and China.

[Insert Table Three about here]

Just as the residential distinction between China and Vietnam matters little to the interplay between births and household economy, the nature and strength of the relationship between recent fertility and household economy is little affected by rural-urban location. Non-farm business activity and wage sector employment are more likely to emerge in urban households, while the odds of sectoral diversification are greater in rural households. However, the impact that a recent birth exerts upon each of these relationships is quite similar, irrespective of rural or urban location. There is some indication, based upon a comparison of the model goodness-of-fit statistics for household non-farm entrepreneurship, that recent fertility and household composition render different economic outcomes, depending on if the household is located in a rural or urban area. The positive impact that a recent birth has upon household business activity is slightly stronger in urban settings than rural settings. Rural-urban location also conditions the impact of other household composition variables upon household entrepreneurship. For

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example, the increased odds of household entrepreneurship associated with young, school-age children in the household are stronger in urban than rural households, while the positive odds of entrepreneurship associated with working-age male household members are stronger in rural than urban households. Overall, though, the improvement in model fit compared to the reduced model without interactions is slight. This fact, along with the absence of improved model fit in the case of wage employment and diversification, suggests that the household demography-household economy dynamic is quite similar across rural and urban settings. Taken together, the comparison of model fit statistics demonstrates that, in general, births have similar effects upon household economic strategy and motivate similar changes across a range of social locations.

Next we elaborate upon key results in selected pooled logistic regression analyses—in particular those models that demonstrate superior goodness-of-fit for predicting each household economy outcome (shown in Table Four). The coefficients for household social context shown in the top panel indicate that the odds of household engagement in entrepreneurship, wage sector employment, and sectoral diversification are highly dependent upon social location. Non-farm entrepreneurship is significantly more likely in Vietnam and in urban places. The odds of wage employment are significantly greater in China than Vietnam, and they are also greater for urban households. Sectoral diversification, by comparison, is more likely to occur in rural areas and in China. The predominance of diversification in rural and Chinese households stems in part from the central role of agriculture in household diversification strategies and from the continued relevance of state sector employment in China. Despite these major differences in the economic landscapes composed of households in rural and urban areas of China and Vietnam, it is important to recall that the impact of a birth upon household economic strategy tends to be similar, irrespective of rural-urban or country location. More specifically, we learn that households' involvement in the wage sector and diversification across sectors is little changed by recent fertility. Household entrepreneurship, an important source of innovation and employment in the course of market transition, tends to be encouraged by the addition of newborn children to the household.

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[Insert Table Four about here]

Concerning features of household age and sex composition, the models demonstrate that greater numbers of working-age men and women increase the odds of entrepreneurship, wage employment, and diversification. By way of interpretation, these results suggest that extended-family households, such as households occupied by a conjugal family along with one or more young grandparents, aunts or uncles, or children-in-law, possess labor and other resources that make possible household entrepreneurship or the combination of activities that span economic sectors. Households with large numbers of working-age adults may also be nuclear units composed of adult children (for example one or more children in their mid-twenties) and their working age parents (who may be in their middle forties or older), whose combined work activities facilitate myriad economic arrangements. Greater numbers of working adults also increase the odds that the household will have at least one member represented in the wage-earning sector. In terms of family adaptive strategy, the results suggest that greater numbers of working adults in the household increase the odds of adapting market-oriented economic arrangements.

Gender differentiated impacts of household composition are also apparent in the pooled analyses. Specifically, compared to numbers of adult women, having greater numbers of adult men in the household plays a stronger role in improving the odds of entrepreneurship, diversification, and wage employment. These results, especially for wage employment and diversification, may obtain due to household and institutional divisions of labor, and as a result of employment discrimination and other practices in the labor force that favor men over women. It does become apparent from these results that men, more so than women, improve the position of households to become diversified, entrepreneurial and otherwise market-oriented. This sort of gender-based disparity, which suggests that women are less important than men for household-based, innovative economic activity, may carry additional, negative consequences for women's status in the family and labor force.

The numeric presence of young adults in the household similarly encourages certain forms of economic participation. Especially with respect to household diversification, the presence of greater

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numbers of young men and women in their late teens to early twenties increases the odds that collectively, the household's activities span private and wage, farm and non-farm sectors. In this age group important gender differences are again observed, with the presence of young men being more important than young women in increasing the odds of wage sector employment. Due to gender differentiated opportunities in the workforce, which have been shown to characterize both China and Vietnam as they undergo market reform, having sons, sons-in-law and other young men in the household appears to be more beneficial than the presence of young women for providing opportunities to access wage employment.

The presence of young children also influences household economic activity. The odds of non-farm entrepreneurship are increased and the odds of wage employment diminished in those households where young and school-age children are present and numerous. These results are largely consistent with the conclusion—usually posited at the level of individual women, that role conflicts and other difficulties tend to emerge when childcare responsibilities associated with the maternal role are combined with wage and formal sector economic activity. Here, we see a similar result at the aggregate level of the household. An important counterpoint is that while young children may inhibit wage employment, which in China and Vietnam tends to be located in more formal settings and in the state sector, their presence serves to heighten another form of market economic participation by the household—the formation of non-farm enterprises.

Above and beyond the consequences of household composition for household economy, the pooled analyses also demonstrate that household socioeconomic status—in terms of educational and material resources possessed by household members, is intertwined with household economic strategy. Due to reciprocal effects, it is impracticable to posit a causal influence between household socioeconomic status and household economic activity. Nonetheless, it appears that households in possession of greater material resources are more likely to be diversified or to have members engaged in the wage sector. Additionally, diversified and wage sector households also are more likely to have members who have

attained secondary schooling and higher. These results uphold the position that wage employment and diversification beyond agriculture are associated with higher standards of living in the market reform era.

CONCLUSION

Perhaps the most significant of our findings is that following the birth of a child the odds that a household is entrepreneurial or diversified across economic sectors increase. In other words, the birth of a child is an event that sets into motion family adaptive economic strategies that expand households' market economic participation. This result obtains across various contexts, most strongly in urban areas, whether they are located in China or Vietnam. It suggests that recent fertility does not retard household-level development, but rather is associated with innovative, positively transformative economic activity. It is important to note, however, that innovative household economic activity need not correlate with improved wellbeing or access to resources within the household. In fact, previous research (e.g., Ronnas 2001) cautions that although non-farm business development is a welcome source of diversification and employment generation, it is often the case that household enterprises, especially in rural areas, resemble "distress industries" that are adopted in lieu of alternative, more lucrative income sources.

Nor are the present analyses equipped to elaborate upon the consequences of child bearing and employment for individual household members, such as the experience of the 'double burden' by women whose roles demand their full participation in economic production, childcare and domestic duties. However, extending the thought of previous research on maternal role compatibility and the greater compatibility of childcare with informal sector employment, it stands to reason that the economic activity of household members—mothers and other kin—is both motivated by the resource demands posed by children and pulled into the domestic, household realm where both economic production and social reproduction are located (Desai and Jain 1994). Our findings are largely consistent with earlier work on the subject, such as Judd's (1994, p.199) finding that mothers of young children in rural China often undertake household-based enterprise, in lieu of wage work that is no longer compatible with childcare.

Our contribution on this perspective is unique, however, in that we demonstrate that households as economic units, not merely individual women workers, evolve economic activity in response to recent fertility and the arrival of young dependents in the home. Moreover, in contrast with the conservative, or scaling back tendencies often observed in women's economic activity following a birth, at the household level, births are linked to innovative change and an expansion of activities.

Through the careful integration of three data sets that span national boundaries we move beyond the common tactic of conducting a single study to arrive at a single conclusion that is then often utilized to test or advance a theoretical position. The preponderance of results derived from the parallel and then pooled analyses of Vietnamese and Chinese households enable us to delineate a strong result from what might otherwise be interpreted as a stray result. Through our systematic comparison of household economies in the two countries we also illuminate how national context shapes household economic strategies, fertility decision-making, and the intersection between these household-level arrangements. By determining whether the specific national context is more important than parallel pan-national post-socialist experiences for household economic activity, we can speak to the relative generalizability of market transition processes and policies. In part due to the challenges in devising comparable social indicators across societies, few scholars have undertaken systematic and direct comparative analyses of social and economic outcomes in these post-socialist countries (Kerkvliet et al. 1999).

What we find is that the geopolitical divide between China and Vietnam is not salient in conditioning the relationship between recent fertility and household economic change. In both China and Vietnam there emerge parallel patterns of economic activity and change under particular household compositional forms and dynamics. The pooled analyses do indicate that the rural-urban divide is salient across both societies in conditioning the relationship between household structure and economic outcomes. The results, admittedly weak, suggest that the odds of a birth bringing about change in the household, in particular the formation of a non-farm business, are somewhat greater in urban than rural settings. The salience of this rural-urban divide for household demographic dynamics and economic

outcomes is maintained across both China and Vietnam, suggesting that this geographic division, which represents differing levels of development, access to markets, and forms of workplace organization, is more remarkable for household economic strategy than the political boundary dividing the households of Vietnam and China. This is not to state that national context is irrelevant to the interplay between household composition and household economy. The robustness of the relationship between fertility and household economic change may diverge in other national settings; further elaboration of the empirical relationship in countries more distant and under different economic regimes will substantiate or challenge the current picture.

Our research has attempted to shed light upon the intersection of family structural features and household economic outcomes in two nations where there has been active state intervention into the arenas of family and economy. By tracking shifts in household economic activity that follow on recent births, we demonstrate that recent fertility and household dynamics facilitate economic transformation. Adding to the frequent focus upon human capital and political capital as determinants of households' status positions and economic outcomes in post-socialist settings, our analyses show that fertility behavior and the gender and age composition of households also play a significant role in determining whether a household innovates, by becoming involved in entrepreneurial activity, wage employment, or a combination of multi-sectoral activities.

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Table 1. Type of Household Economic Activity in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS

| Location | Non-diversified | | Diversified | Entrepreneurial | Wage Sector | No Activity | |
	Households with activity in only one sector	Households with agriculture only	Households involved in two or more economic sectors	Households operating a non-farm business	Households with at least one wage employee	No members reporting economic activity†	Number of households
RED RIVER DELTA (VLS Households)							
Share of Rural Households, 1995	54.7%	47.4%	44.9%	35.2%	22.6%	0.3%	1463
Share of Rural Households, 1998	65.2%	58.1%	34.4%	25.1%	20.4%	0.3%	1463
Share of Urban Households, 1995	59.2%	1.6%	37.4%	67.1%	53.9%	3.5%	316
Share of Urban Households, 1998	65.2%	2.2%	30.7%	64.6%	53.8%	4.1%	316
VIETNAM (VNLSS Households)							
Share of Rural Households, 1992-3	60.8%	56.0%	36.4%	25.7%	21.1%	2.8%	3396
Share of Rural Households, 1997-8	57.1%	51.9%	39.7%	27.5%	23.9%	3.2%	3396
Share of Urban Households, 1992-3	45.8%	11.5%	49.9%	59.2%	53.8%	4.3%	904
Share of Urban Households, 1997-8	53.1%	10.2%	39.8%	53.8%	53.8%	7.1%	904
CHINA (CHNS Households)							
Share of Rural Households, 1993	49.6%	37.6%	49.3%	21.2%	58.7%	1.0%	1660
Share of Rural Households, 1997	45.7%	35.4%	49.5%	25.3%	55.4%	4.9%	1660
Share of Urban Households, 1993	60.8%	15.7%	36.6%	11.4%	79.9%	2.6%	617
Share of Urban Households, 1997	57.5%	12.8%	28.9%	18.6%	68.7%	13.6%	617

† The sizable share of urban households in the VLNSS and CHNS samples with no economic activity at time two, especially those in the VNLSS and CHNS samples, may be attributed to several factors, including the aging of household members into nonworking status position, temporary unemployment, and subsistence through alternative income sources (e.g., remittance, rent)

Table 2. Type of Household Economic Activity and Recent Fertility in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS

Location	Diversified Households involved in two or more economic sectors	Entrepreneurial Households operating a non-farm business	Wage Sector Households with at least one wage employee	No Activity No members reporting economic activity†	Number of Households
RED RIVER DELTA (VLS Households)					
Rural Households in 1998 w/ no births since 1995	34.1%	24.8%	21.4%	0.4%	1463
Rural Households in 1998 w/ 1 or more births since 1995	35.2%	26.4%	16.6%	0.0%	1463
Urban Households in 1998 w/ no births since 1995	31.9%	62.6%	56.4%	4.6%	316
Urban Households in 1998 w/ 1 or more births since 1995	25.4%	74.5%	41.8%	1.8%	316
VIETNAM (VNLSS Households)					
Rural Households in 1998 w/ no births since 1992-3	39.5%	27.1%	24.2%	4.0%	3396
Rural Households in 1998 w/ 1 or more births since 1992-3	40.2%	28.5%	23.4%	2.6%	3396
Urban Households in 1998 w/ no births since 1992-3	37.8%	52.5%	51.8%	8.8%	904
Urban Households in 1998 w/ 1 or more births since 1992-3	46.0%	57.6%	59.8%	1.8%	904
CHINA (CHNS Households)					
Rural Households in 1998 w/ no births since 1993	48.4%	24.5%	54.4%	5.4%	1660
Rural Households in 1998 w/ 1 or more births since 1993	56.1%	30.8%	62.4%	1.4%	1660
Urban Households in 1998 w/ no births since 1993	26.7%	16.9%	68.9%	15.0%	617
Urban Households in 1998 w/ 1 or more births since 1993	44.2%	31.2%	67.5%	3.9%	617

† The sizable share of urban households in the VLNSS and CHNS samples with no economic activity at time two, especially those in the VNLSS and CHNS samples, may be attributed to several factors, including the aging of household members into nonworking status position, temporary unemployment, and subsistence through alternative income sources (e.g., remittance, rent)

Table 3. Goodness of Fit Statistics Assessing Models for the Determinants of Household Economic Outcomes in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS

Models Predicting Household Non-farm Entrepreneurship

	Model Fitting Statistics		Superior Model
Model Description	*BIC*	*Chi-Square (df)*	
Model 1: Basic model	-95897.8	1217.78(19)	
Model 2: Also includes interaction between recent birth and rural-urban location	-95902.2	1251.54(20)	x
Model 3: Also includes interactions between recent birth, household composition and rural-urban location	-95898.7	1270.54(25)	
Model 4: Also includes interaction between recent birth and country location	-95900.1	1227.44(20)	
Model 5: Also includes interactions between recent birth, household composition and country location	-95883.9	1235.39(25)	

Models Predicting Household Diversification Across Multiple Sectors

	Model Fitting Statistics		Superior Model
Model Description	*BIC*	*Chi-Square (df)*	
Model 1: Basic model	-93506.2	908.08(19)	x
Model 2: Also includes interaction between recent birth and rural-urban location	-92893.8	669.96(20)	
Model 3: Also includes interactions between recent birth, household composition and rural-urban location	-92898.8	686.21(25)	
Model 4: Also includes interaction between recent birth and country location	-92893.1	673.87(20)	
Model 5: Also includes interactions between recent birth, household composition and country location	-92886.8	762.57(25)	

Models Predicting Wage Employment in Household

	Model Fitting Statistics		Superior Model
Model Description	*BIC*	*Chi-Square (df)*	
Model 1: Basic model	-96080.0	1725.07(19)	x
Model 2: Also includes interaction between recent birth and rural-urban location	-94788.8	1023.60(20)	
Model 3: Also includes interactions between recent birth, household composition and rural-urban location	-94772.3	1107.78(25)	
Model 4: Also includes interaction between recent birth and country location	-94793.5	1032.8(20)	
Model 5: Also includes interactions between recent birth, household composition and country location	-94750.2	1128.14(25)	

Note: Details of all models are presented in Appendix Tables A4-A6 and include variables for country location, urban-rural location, region, recent births and household composition

Models 2-5 also include an interaction variable between country location and urban-rural location

Table 4. Selected Models of Household Economic Activity based on Pooled Analyses of Data for Red River Delta, Vietnam and China: VLS, VNLSS and CHNS

	Household Economic Outcome		
	Non-farm Entrepreneurship	Diversification across Sectors	Wage Employment
Context Variables			
Country - China	-0.371**	0.289**	1.007**
	(0.105)	(0.084)	(0.084)
Urban	0.492**	-0.426**	0.514**
	(0.145)	(0.095)	(0.097)
Region (Coastal/South)	-0.069	-0.007	0.253**
	(0.096)	(0.093)	(0.091)
Region (Mountains)	0.283**	0.143	0.141
	(0.106)	(0.107)	(0.103)
China*Urban	-0.473*	--	--
	(0.214)	--	--
HH Variables			
Any birth between surveys	0.152*	0.122	-0.067
	(0.075)	(0.062)	(0.071)
No. of children < 15	0.081**	0.047	-0.093**
	(0.027)	(0.026)	(0.027)
No. of males 15-24 in household	0.048	0.229**	0.163**
	(0.036)	(0.034)	(0.039)
No. of females 15-24 in household	0.056	0.149**	0.049
	(0.033)	(0.033)	(0.037)
No. of males 25-59 in household	0.218**	0.324**	0.278**
	(0.046)	(0.047)	(0.053)
No. of females 25-59 in household	0.132*	0.129*	0.123*
	(0.055)	(0.052)	(0.060)
No. of males & females 60-69 in household	-0.031	-0.120**	-0.164**
	(0.047)	(0.044)	(0.049)
No. of males & females 70+ in household	-0.068	-0.138**	-0.223**
	(0.053)	(0.048)	(0.052)
HH Socioeconomic Status			
Household has any member with Upper Sec. School	-0.006	0.242**	0.585**
	(0.057)	(0.049)	(0.056)
Household Wealth Index	0.003	0.002	0.115**
	(0.013)	(0.014)	(0.015)
Household Possesses Flush Toilet	0.086	-0.545**	0.209*
	(0.098)	(0.099)	(0.094)
Household Possesses Earthen Floor	-0.132	-0.153*	-0.149*
	(0.075)	(0.069)	(0.072)
Household Possesses a TV	0.313**	0.234**	-0.162
	(0.078)	(0.072)	(0.083)
Household Possesses Motorized Transport	0.413**	0.325**	-0.198*
	(0.100)	(0.097)	(0.099)
Household had this Economic Activity at Time One	1.805**	1.345**	1.636**
	(0.064)	(0.059)	(0.076)
Urban Interaction Variables			
Any Birth*Urban	0.207	--	--
	(0.136)	--	--
Constant	-2.342**	-1.848**	-2.594**
	(0.127)	(0.106)	(0.118)
Observations	11463	11463	11490
Pseudo R-squared	0.17	0.13	0.30
Wald Chi sq	1251.54	908.08	1725.07
Log likelihood	-5517.73	-6725.0788	-5577.8577
BIC	-95902.19	-93506.187	-96079.98

Robust standard errors are presented in parentheses

* significant at 5%; ** significant at 1%

Models with best goodness of fit statistics as shown in Table 3 are presented in this table. They are also presented in Appendix Tables A4-A6

Omitted categories for dummy variables are Region (Inland/North), Rural, and Country (Vietnam)

Figure 1. A comparative, longitudinal approach to analyzing household
demography and economy: Combining the CHNS, VNLSS and VLS

CHNS

4 years~
any birth?

4 years~
any birth?

VNLSS

5 years~
any birth?

VLS

3 years~
any birth?

● Data Collection Point

1989   1990   1991   1992   1993   1994   1995   1996   1997   1998   1999   2000

Figure 2A. The Influence of a Recent Birth on the Probability of Household Non-farm Entrepreneurship in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS

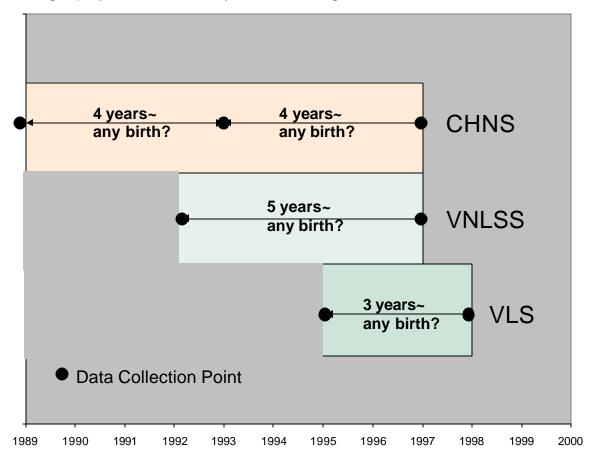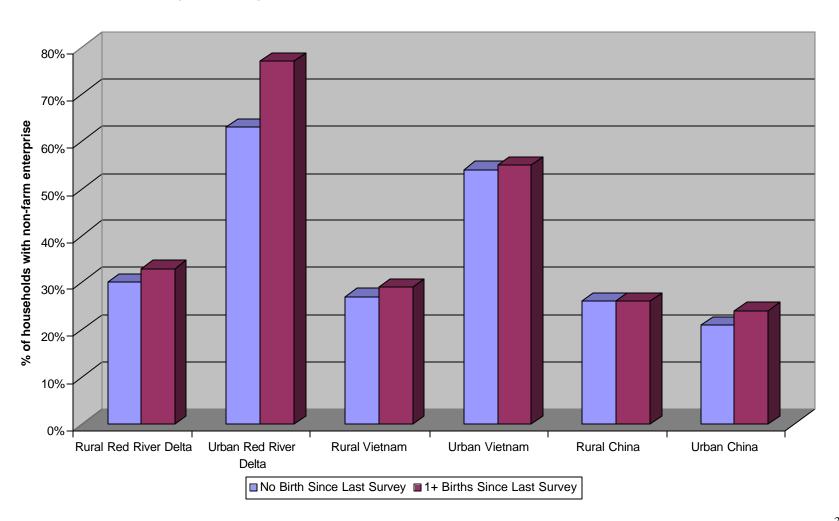**Figure 2B. The Influence of a Recent Birth on the Probability of Household Diversification in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS**
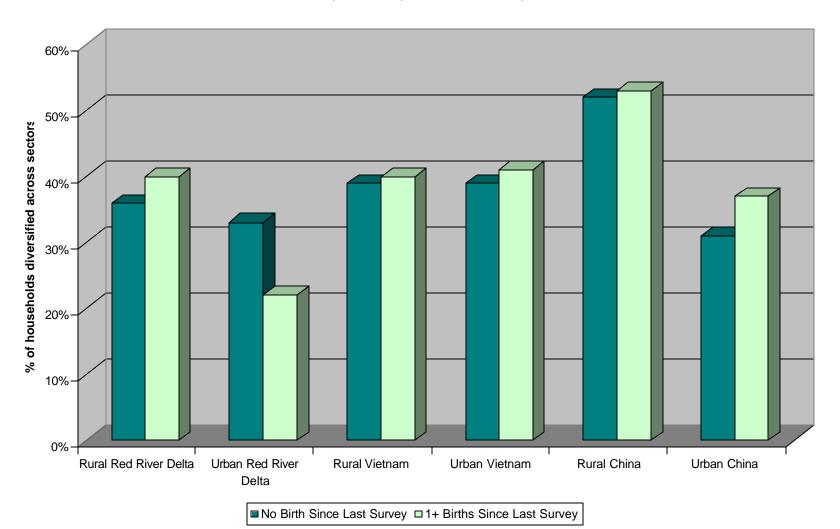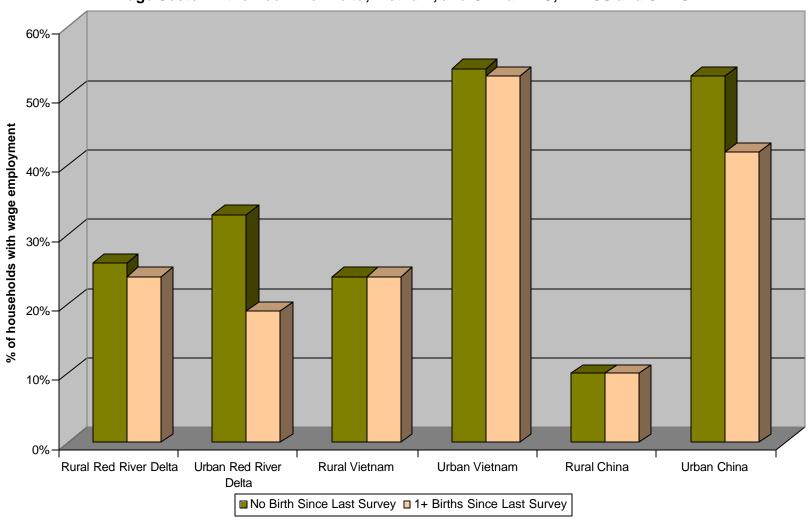
Figure 2C. The Influence of a Recent Birth on the Probability of Household Involvement in the Wage Sector in the Red River Delta, Vietnam, and China: VLS, VNLSS and CHNS

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Appendix Table A1: Determinants of Household Economic Activity in 1998: Rural Households, VLS 1998
--RURAL HOUSEHOLDS--

	HH Non-farm Entrepreneurship		HH Diversification across Sectors		HH Wage Employment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1995	0.083	0.211	0.040	0.186	-0.314	-0.170
	(0.207)	(0.253)	(0.179)	(0.222)	(0.214)	(0.257)
No. of males & females 3 to 5 in household		0.000		-0.104		-0.149
		(0.081)		(0.091)		(0.108)
No. of males & females 6-14 in household		-0.016		-0.160**		-0.380**
		(0.067)		(0.057)		(0.092)
No. of males 15-24 in household		0.003		0.062		-0.036
		(0.066)		(0.072)		(0.099)
No. of females 15-24 in household		-0.100		0.042		0.096
		(0.082)		(0.070)		(0.159)
No. of males 25-59 in household		-0.106		0.029		0.080
		(0.082)		(0.087)		(0.122)
No. of females 25-59 in household		0.227*		0.353**		0.075
		(0.101)		(0.065)		(0.058)
No. of males & females 60-69 in household		0.095		0.005		0.121
		(0.140)		(0.130)		(0.183)
No. of males & females 70+ in household		-0.104		0.063		0.153
		(0.169)		(0.098)		(0.090)
Household Resources						
Household has any member with Upper Sec. School		-0.113		0.113		0.430*
		(0.221)		(0.118)		(0.170)
Household Wealth Index		0.068		0.058		0.112*
		(0.055)		(0.039)		(0.054)
Household Possesses Flush Toilet		0.994**		0.273		0.533
		(0.215)		(0.209)		(0.344)
Household Possesses Earthen Floor		-0.085		-0.289		-0.331
		(0.239)		(0.153)		(0.291)
Household Possesses a TV		0.083		0.081		0.023
		(0.259)		(0.154)		(0.317)
Household Possesses Motorized Transport		0.358		0.101		0.067
		(0.304)		(0.218)		(0.172)
Household Activity in 1993						
Household Had Family Business in 1995		1.689**		-		-
		(0.113)				
Household Had 2+ Activities in 1995		-		1.109**		-
				(0.084)		
Household Had Wage Activity in 1995		-		-		1.628**
						(0.222)
Constant	-1.104**	-2.356**	-0.647**	-1.770**	-1.295**	-2.318**
	(0.190)	(0.201)	(0.081)	(0.177)	(0.207)	(0.301)
Observations	1455	1455	1455	1455	1455	1455
Pseudo R-squared	.00	.16	.00	.09	.00	.18
LR chi2	--	--	.05	--	2.15	--
Log Likelihood	-821.59	-692.57	-938.06	-852.41	-735.89	-604.74
BIC	-8938.7	-9087.47	-8705.7	-8767.80	-9110.1	-9263.13

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Appendix Table A1: Determinants of Household Economic Activity in 1998: Urban Households, VLS 1998
--URBAN HOUSEHOLDS--

	HH Non-farm Entrepreneurship		HH Diversification across Sectors		HH Wage Employment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1995	0.529**	0.966*	-0.393	-0.639	-0.725*	-1.685**
	(0.127)	(0.416)	(0.480)	(0.605)	(0.320)	(0.417)
No. of males & females 3 to 5 in household		0.727*		-0.025		-0.407*
		(0.336)		(0.472)		(0.196)
No. of males & females 6-14 in household		0.164		-0.357		-0.264
		(0.470)		(0.193)		(0.177)
No. of males 15-24 in household		0.523**		0.293**		0.188
		(0.160)		(0.103)		(0.181)
No. of females 15-24 in household		0.595*		-0.199		-0.354
		(0.279)		(0.333)		(0.283)
No. of males 25-59 in household		-0.280**		0.369		0.821
		(0.105)		(0.368)		(0.463)
No. of females 25-59 in household		-0.208		0.483		0.788
		(0.188)		(0.323)		(0.650)
No. of males & females 60-69 in household		-0.398*		0.310**		0.900**
		(0.193)		(0.103)		(0.221)
No. of males & females 70+ in household		-0.371		-0.422*		-0.265
		(0.274)		(0.173)		(0.275)
Household Resources						
Household has any member with Upper Sec. School		-0.364		0.156		0.446
		(0.426)		(0.145)		(0.745)
Household Wealth Index		-0.063		-0.096**		-0.054
		(0.047)		(0.037)		(0.055)
Household Possesses Flush Toilet		0.120		0.020		0.144
		(0.303)		(0.401)		(0.139)
Household Possesses Earthen Floor		--		--		--
		--		--		--
Household Possesses a TV		-1.309**		0.503*		1.389
		(0.193)		(0.232)		(0.911)
Household Possesses Motorized Transport		0.292**		0.565		0.568**
		(0.072)		(0.521)		(0.200)
Household Activity in 1993						
Household Had Family Business in 1995		2.707**		-		-
		(0.416)				
Household Had 2+ Activities in 1995		-		1.600*		-
				(0.676)		
Household Had Wage Activity in 1995		-		-		3.863**
						(0.184)
Constant	0.620*	0.471	-0.656**	-2.126**	0.426	-4.345**
	(0.290)	(0.466)	(0.189)	(0.466)	(0.283)	(0.779)
Observations	297	297	297	297	297	297
Pseudo R-squared	.01	.29	.00	.14	.01	.47
LR chi2	17.4	--	.67	--	5.13	--
Log Likelihood	-187.10	-134.56	-186.93	-161.29	-199.88	-108.34
BIC	-1305.45	-1330.82	-1305.8	-1277.36	-1279.9	-1383.26

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Appendix Table A2: Determinants of Household Economic Activity in 1997-98: Rural Households VNLSS 1997

--RURAL HOUSEHOLDS--

	HH Non-farm Entrepreneurship		HH Diversification across Sectors		HH Wage Employment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1992-93	0.072	0.085	0.031	0.048	-0.044	-0.023
	(0.084)	(0.096)	(0.081)	(0.086)	(0.091)	(0.098)
No. of males & females 6-14 in household[+]		0.069		0.060		-0.081
		(0.048)		(0.040)		(0.044)
No. of males 15-24 in household		-0.106		0.158**		0.233**
		(0.066)		(0.058)		(0.063)
No. of females 15-24 in household		0.060		0.145*		0.065
		(0.061)		(0.058)		(0.059)
No. of males 25-59 in household		0.529**		0.558**		0.427**
		(0.107)		(0.099)		(0.109)
No. of females 25-59 in household		0.322**		0.414**		0.246*
		(0.108)		(0.103)		(0.103)
No. of males & females 60-69 in household		0.027		0.009		-0.123
		(0.093)		(0.082)		(0.085)
No. of males & females 70+ in household		0.048		-0.043		-0.074
		(0.095)		(0.091)		(0.101)
Household Resources						
Household has any member with Upper Sec. School		0.127		0.283**		0.319**
		(0.100)		(0.089)		(0.101)
Household Wealth Index		0.002		0.065*		0.073*
		(0.030)		(0.028)		(0.028)
Household Possesses Flush Toilet		0.198		-0.049		0.275
		(0.228)		(0.210)		(0.199)
Household Possesses Earthen Floor		-0.282*		-0.284**		-0.267*
		(0.117)		(0.105)		(0.115)
Household Possesses a TV		0.286*		-0.005		-0.264*
		(0.133)		(0.116)		(0.131)
Household Possesses Motorized Transport		0.249		0.105		-0.058
		(0.183)		(0.168)		(0.178)
Household Activity in 1992-93						
Household Had Family Business in 1992-93		1.680**		-		-
		(0.108)				
Household Had 2+ Activities in 1992-93		-		0.862**		-
				(0.093)		
Household Had Wage Activity in 1992-93		-		-		1.270**
						(0.101)
Region (Northern plains omitted)						
Southern plains		-0.279		-0.531**		-0.136
		(0.157)		(0.129)		(0.128)
Mountains		-0.495*		-0.754**		-0.588**
		(0.194)		(0.167)		(0.180)
Constant	-0.991**	-2.307**	-0.428**	-1.698**	-1.144**	-2.081**
	(0.075)	(0.197)	(0.062)	(0.161)	(0.065)	(0.159)
Observations	3396	3396	3396	3396	3396	3396
Pseudo R-squared	0.00	0.15	0.00	0.12	0.00	0.11
LR chi2(3)	0.73	448.94	0.15	398.55	0.23	344.13
Log Likelihood	-1998.10	-1696.14	-2281.18	-2008.23	-1867.83	-1660.04
BIC	-23598.2	-24072.0	-23032.1	-23447.9	-23858.8	-24144.3

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%
[+] Children aged 6 who were born before 1992-93 are excluded

Appendix Table A2: Determinants of Household Economic Activity in 1997-98: Urban Households VNLSS 1997-98

	HH Non-farm Entrepreneurship		**HH Diversification across Sectors**		**HH Wage Employment**	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1992-93	0.206	0.058	0.337*	0.098	0.327	-0.045
	(0.161)	(0.190)	(0.144)	(0.174)	(0.183)	(0.200)
No. of males & females 6-14 in household[+]		0.187*		0.243**		0.120
		(0.085)		(0.080)		(0.095)
No. of males 15-24 in household		0.230*		0.393**		0.182
		(0.099)		(0.118)		(0.139)
No. of females 15-24 in household		-0.105		0.213*		0.403**
		(0.113)		(0.099)		(0.129)
No. of males 25-59 in household		0.319*		0.724**		0.720**
		(0.134)		(0.143)		(0.165)
No. of females 25-59 in household		0.341*		0.377*		0.489**
		(0.148)		(0.171)		(0.165)
No. of males & females 60-69 in household		0.017		0.187		0.194
		(0.159)		(0.141)		(0.156)
No. of males & females 70+ in household		-0.010		0.002		-0.038
		(0.163)		(0.173)		(0.180)
Household Resources						
Household has any member with Upper Sec. School		-0.092		0.092		0.595**
		(0.182)		(0.218)		(0.210)
Household Wealth Index		-0.047		-0.033		-0.003
		(0.041)		(0.041)		(0.034)
Household Possesses Flush Toilet		0.005		-0.644**		-0.020
		(0.206)		(0.204)		(0.195)
Household Possesses Earthen Floor		-0.855**		-0.272		0.157
		(0.307)		(0.351)		(0.283)
Household Possesses a TV		0.624*		0.222		-0.253
		(0.265)		(0.250)		(0.285)
Household Possesses Motorized Transport		-0.021		-0.243		0.437
		(0.291)		(0.251)		(0.288)
Household Activity in 1992-93						
Household Had Family Business in 1992-93		1.628**		-		-
		(0.157)				
Household Had 2+ Activities in 1992-93		-		1.008**		-
				(0.129)		
Household Had Wage Activity in 1992-93		-		-		2.071**
						(0.189)
Region (Northern plains omitted)						
Southern plains		0.277		-0.122		-0.497*
		(0.239)		(0.215)		(0.230)
Mountains		-0.152		-0.240		-0.322
		(0.389)		(0.338)		(0.330)
Constant	0.100	-1.817**	-0.498**	-2.026**	0.071	-2.443**
	(0.123)	(0.338)	(0.109)	(0.307)	(0.098)	(0.394)
Observations	904	904	904	904	904	904
Pseudo R-squared	0.00	0.17	0.00	0.14	0.00	0.26
LR chi2(3)	1.63	197.95	5.47	279.36	3.20	258.99
Log Likelihood	-623.16	-520.56	-605.41	-524.08	-621.83	-464.22
BIC	-4893.4	-4989.7	-4928.9	-4982.7	-4896.1	-5102.4

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

[+] Children aged 6 who were born before 1992-93 are excluded

	HH Non-farm Entrepreneurship		HH Diversification across Sectors		HH Wage Employment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1993	0.171	-0.031	0.174	0.068	-0.116	-0.101
	(0.147)	(0.171)	(0.142)	(0.167)	(0.303)	(0.408)
No. of males & females 6-14 in household		0.029		0.004		-0.200 *
		(0.048)		(0.048)		(0.101)
No. of males 15-24 in household		0.116		0.455 ***		-0.624 ***
		(0.094)		(0.088)		(0.189)
No. of females 15-24 in household		-0.070		0.125		-0.116
		(0.094)		(0.092)		(0.151)
No. of males 25-59 in household		-0.035		0.046		-0.137
		(0.123)		(0.103)		(0.200)
No. of females 25-59 in household		0.041		-0.115		0.002
		(0.112)		(0.091)		(0.172)
No. of males & females 60-69 in household		-0.093		-0.185		0.154
		(0.111)		(0.099)		(0.151)
No. of males & females 70+ in household		-0.158		-0.284 *		0.217
		(0.122)		(0.118)		(0.171)
Household Resources						
Household has any member with Upper Sec. School		0.039		0.215		0.703 ***
		(0.150)		(0.122)		(0.198)
Household Wealth Index		0.083 ***		0.096 **		0.036
		(0.025)		(0.033)		(0.047)
Household Possesses Flush Toilet		0.348		-0.236		1.304 *
		(0.222)		(0.264)		(0.596)
Household Possesses Earthen Floor		-0.235		-0.306		0.132
		(0.176)		(0.170)		(0.614)
Household Possesses a TV		0.245		0.075		2.877 **
		(0.226)		(0.231)		(0.948)
Household Possesses Motorized Transport		0.129		-0.156		0.095
		(0.235)		(0.265)		(0.390)
Household Activity in 1993						
Household Had Family Business in 1993		1.495 ***				
		(0.137)				
Household Had 2+ Activities in 1993				1.309 ***		
				(0.141)		
Household Had Wage Activity in 1993						2.748 ***
						(0.443)
Region (Inland omitted)						
Coastal		-0.564 **		-0.011		0.326
		(0.209)		(0.216)		(0.415)
Southern Mountains		0.363 *		0.151		-0.449
		(0.185)		(0.226)		(0.542)
Constant	-1.067 ***	-2.170 ***	0.045	-1.275 ***	-2.168 ***	-6.054 ***
	(0.101)	(0.258)	(0.101)	(0.232)	(0.228)	(1.014)
Observations	1699	1699	1699	1699	1699	1699
Pseudo R-squared	0.00	0.13	0.00	0.13	0.00	0.39
BIC	-10673.3	-10813.1	-10270.2	-10466.2	-11508.3	-11820.0
Wald Chi Square	1.36	194.15	1.51	218.24	0.15	253.16

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

Appendix Table A3: Determinants of Household Economic Activity in 1997: Urban Households, CHNS 1997

	HH Non-farm Entrepreneurship		HH Diversification across Sectors		HH Wage Employment	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Household Composition						
Any birth within household since 1993	0.557 *	0.254	0.582 *	0.369	-0.837 *	-1.034 *
	(0.278)	(0.392)	(0.292)	(0.334)	(0.329)	(0.423)
No. of males & females 6-14 in household		0.275 *		0.244 *		-0.350 **
		(0.109)		(0.113)		(0.112)
No. of males 15-24 in household		-0.085		0.100		-0.324
		(0.215)		(0.174)		(0.194)
No. of females 15-24 in household		0.281		0.486 *		-0.510
		(0.213)		(0.206)		(0.317)
No. of males 25-59 in household		-0.360		-0.088		0.375
		(0.292)		(0.285)		(0.285)
No. of females 25-59 in household		0.072		0.001		0.309
		(0.252)		(0.204)		(0.278)
No. of males & females 60-69 in household		0.080		-0.116		0.167
		(0.202)		(0.206)		(0.252)
No. of males & females 70+ in household		0.035		-0.002		-0.308
		(0.230)		(0.268)		(0.388)
Household Resources						
Household has any member with Upper Sec. School		-0.874 ***		-0.287		0.787 *
		(0.248)		(0.288)		(0.339)
Household Wealth Index		0.063		0.027		0.013
		(0.055)		(0.055)		(0.062)
Household Possesses Flush Toilet		-0.111		-0.642 *		1.171 **
		(0.324)		(0.301)		(0.421)
Household Possesses Earthen Floor		0.277		0.570		-1.034 *
		(0.260)		(0.340)		(0.508)
Household Possesses a TV		-0.185		-0.344		0.734
		(0.347)		(0.412)		(0.663)
Household Possesses Motorized Transport		0.694 *		0.417		0.119
		(0.307)		(0.275)		(0.370)
Household Activity in 1993						
Household Had Family Business in 1993		1.514 ***				
		(0.293)				
Household Had 2+ Activities in 1993				1.349 ***		
				(0.264)		
Household Had Wage Activity in 1993						2.782 ***
						(0.416)
Region (Inland omitted)						
Coastal		-0.910		-1.688 **		1.858 ***
		(0.645)		(0.545)		(0.549)
Southern Mountains		0.875 **		0.348		-0.481
		(0.318)		(0.346)		(0.450)
Constant	-1.404 ***	-1.892 **	-0.834 ***	-1.247 *	0.163	-3.045 ***
	(0.193)	(0.600)	(0.206)	(0.493)	(0.262)	(0.808)
Observations	572	572	572	572	572	572
Pseudo R-squared	0.01	0.20	0.01	0.22	0.01	0.54
BIC	-3032.8	-3043.9	-2905.9	-2957.6	-2837.9	-3149.2
Wald Chi Square	4.02	172.77	3.98	163.02	6.47	242.60

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

Appendix Table A4: Pooled Logistic Regression Analysis: The Determinants of Household Involvement in Non-farm Entrepreneurship in the Red River Delta, Vietnam and China

	Model 1	Model 2	Model 3	Model 4	Model 5
Context Variables					
Country - China	-0.460**	-0.371**	-0.403**	-0.373**	-0.502**
	(0.090)	(0.105)	(0.104)	(0.111)	(0.183)
Urban	0.238*	0.492**	0.111	0.543**	0.490**
	(0.102)	(0.145)	(0.184)	(0.134)	(0.134)
Region (Coastal/South)	-0.013	-0.069	-0.065	-0.069	-0.031
	(0.096)	(0.096)	(0.095)	(0.096)	(0.096)
Region (Mountains)	0.306**	0.283**	0.296**	0.281**	0.275**
	(0.108)	(0.106)	(0.104)	(0.106)	(0.105)
China*Urban	-	-0.473*	-0.397	-0.492*	-0.416*
	-	(0.214)	(0.208)	(0.214)	(0.210)
HH Variables					
Any birth between surveys	0.195**	0.152*	0.127	0.184*	0.141
	(0.065)	(0.075)	(0.076)	(0.077)	(0.079)
No. of children < 15	0.075**	0.081**	0.022	0.082**	0.018
	(0.027)	(0.027)	(0.030)	(0.027)	(0.035)
No. of males 15-24 in household	0.048	0.048	-0.012	0.049	-0.048
	(0.036)	(0.036)	(0.041)	(0.036)	(0.043)
No. of females 15-24 in household	0.055	0.056	0.021	0.056	0.023
	(0.033)	(0.033)	(0.037)	(0.033)	(0.041)
No. of males 25-59 in household	0.223**	0.218**	0.279**	0.220**	0.325**
	(0.045)	(0.046)	(0.056)	(0.045)	(0.061)
No. of females 25-59 in household	0.139*	0.132*	0.113	0.133*	0.166*
	(0.055)	(0.055)	(0.064)	(0.055)	(0.075)
No. of males & females 60-69 in household	-0.032	-0.031	-0.022	-0.030	-0.028
	(0.046)	(0.047)	(0.046)	(0.047)	(0.047)
No. of males & females 70+ in household	-0.071	-0.068	-0.050	-0.068	-0.070
	(0.052)	(0.053)	(0.053)	(0.053)	(0.053)
HH Socioeconomic Status					
Household has any member with Upper Sec. School	-0.005	-0.006	-0.007	-0.006	-0.012
	(0.057)	(0.057)	(0.057)	(0.057)	(0.057)
Household Wealth Index	-0.001	0.003	0.006	0.003	0.004
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Household Possesses Flush Toilet	0.104	0.086	0.097	0.087	0.102
	(0.098)	(0.098)	(0.097)	(0.098)	(0.098)
Household Possesses Earthen Floor	-0.138	-0.132	-0.138	-0.132	-0.139
	(0.075)	(0.075)	(0.074)	(0.075)	(0.075)
Household Possesses a TV	0.325**	0.313**	0.312**	0.314**	0.309**
	(0.077)	(0.078)	(0.078)	(0.078)	(0.077)
Household Possesses Motorized Transport	0.449**	0.413**	0.399**	0.416**	0.400**
	(0.101)	(0.100)	(0.100)	(0.100)	(0.100)
Household had this Economic Activity at Time One	1.823**	1.805**	1.794**	1.805**	1.799**
	(0.063)	(0.064)	(0.063)	(0.064)	(0.064)
Country Interaction Variables					
Any birth*China	-	-	-	0.044	0.202
	-	-	-	(0.126)	(0.132)
Children 0-15*China	-	-	-	-	0.188**
	-	-	-	-	(0.054)
No. of males 15-24*China	-	-	-	-	0.302**
	-	-	-	-	(0.069)
No. of females 15-24*China	-	-	-	-	0.105
	-	-	-	-	(0.068)
No. of males 25-59*China	-	-	-	-	-0.212*
	-	-	-	-	(0.094)
No. of females 25-59*China	-	-	-	-	-0.076
	-	-	-	-	(0.113)
Urban Interaction Variables					
Any birth*Urban	-	0.207	0.332*	-	-
	-	(0.136)	(0.152)	-	-
Children 0-15*Urban	-	-	0.331**	-	-
	-	-	(0.064)	-	-
No. of males 15-24*Urban	-	-	0.319**	-	-
	-	-	(0.078)	-	-
No. of females 15-24*Urban	-	-	0.170	-	-
	-	-	(0.088)	-	-
No. of males 25-59*Urban	-	-	-0.259**	-	-
	-	-	(0.096)	-	-
No. of females 25-59*Urban	-	-	0.061	-	-
	-	-	(0.116)	-	-
Constant	-2.342**	-2.342**	-2.261**	-2.355**	-2.325**
	(0.123)	(0.127)	(0.128)	(0.128)	(0.140)
Observations	11463	11463	11463	11463	11463
Pseudo R-squared	0.17	0.17	0.18	0.17	0.18
Wald Chi sq	1217.78	1251.54	1370.54	1227.44	1235.39
Log likelihood	-5529.273	-5517.73	-5496.09	-5518.78	-5503.49
BIC	-95897.8	-95902.19	-95898.73	-95900.09	-95883.94

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%
Omitted categories for dummy variables are Region (Inland/North), Rural, and Country (Vietnam)

Appendix Table A5: Pooled Logistic Regression Analysis: The Determinants of Household Economic Diversification in the Red River Delta, Vietnam and China

	Model 1	Model 2	Model 3	Model 4	Model 5
Context Variables					
Country - China	0.289**	0.579**	0.551**	0.607**	0.570**
	(0.084)	(0.099)	(0.097)	(0.101)	(0.140)
Urban	-0.426**	-0.171	-0.555**	-0.124	-0.186
	(0.095)	(0.135)	(0.188)	(0.136)	(0.137)
Region (Coastal/South)	-0.007	-0.073	-0.071	-0.079	-0.042
	(0.093)	(0.106)	(0.104)	(0.106)	(0.106)
Region (Mountains)	0.143	0.090	0.096	0.087	0.083
	(0.107)	(0.119)	(0.117)	(0.119)	(0.118)
China*Urban	-	-0.678**	-0.608**	-0.702**	-0.624**
	-	(0.174)	(0.169)	(0.177)	(0.176)
HH Variables					
Any birth between surveys	0.122	0.090	0.080	0.168*	0.118
	(0.062)	(0.068)	(0.068)	(0.076)	(0.077)
No. of children < 15	0.047	0.032	-0.026	0.030	-0.038
	(0.026)	(0.026)	(0.026)	(0.026)	(0.031)
No. of males 15-24 in household	0.229**	0.236**	0.221**	0.237**	0.136**
	(0.034)	(0.035)	(0.039)	(0.035)	(0.041)
No. of females 15-24 in household	0.149**	0.152**	0.113**	0.152**	0.114**
	(0.033)	(0.035)	(0.037)	(0.035)	(0.041)
No. of males 25-59 in household	0.324**	0.344**	0.360**	0.348**	0.448**
	(0.047)	(0.047)	(0.055)	(0.047)	(0.055)
No. of females 25-59 in household	0.129*	0.151**	0.159**	0.158**	0.243**
	(0.052)	(0.053)	(0.061)	(0.053)	(0.067)
No. of males & females 60-69 in household	-0.120**	-0.107*	-0.104*	-0.105*	-0.105*
	(0.044)	(0.046)	(0.046)	(0.046)	(0.046)
No. of males & females 70+ in household	-0.138**	-0.140**	-0.134**	-0.139**	-0.142**
	(0.048)	(0.050)	(0.050)	(0.050)	(0.050)
HH Socioeconomic Status					
Household has any member with Upper Sec. School	0.242**	0.291**	0.293**	0.290**	0.283**
	(0.049)	(0.051)	(0.051)	(0.051)	(0.051)
Household Wealth Index	0.002	0.013	0.015	0.013	0.016
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Household Possesses Flush Toilet	-0.545**	-0.717**	-0.714**	-0.720**	-0.709**
	(0.099)	(0.110)	(0.109)	(0.110)	(0.109)
Household Possesses Earthen Floor	-0.153*	-0.218**	-0.224**	-0.219**	-0.229**
	(0.069)	(0.074)	(0.073)	(0.074)	(0.073)
Household Possesses a TV	0.234**	0.262**	0.263**	0.263**	0.257**
	(0.072)	(0.072)	(0.072)	(0.072)	(0.071)
Household Possesses Motorized Transport	0.325**	0.235*	0.215*	0.238*	0.216*
	(0.097)	(0.098)	(0.097)	(0.098)	(0.097)
Household had this Economic Activity at Time One	1.345**	0.908**	0.894**	0.911**	0.901**
	(0.059)	(0.064)	(0.064)	(0.064)	(0.064)
Country Interaction Variables					
Any birth*China	-	-	-	-0.136	0.032
	-	-	-	(0.126)	(0.131)
Children 0-15*China	-	-	-	-	0.179**
	-	-	-	-	(0.051)
No. of males 15-24*China	-	-	-	-	0.281**
	-	-	-	-	(0.069)
No. of females 15-24*China	-	-	-	-	0.111
	-	-	-	-	(0.071)
No. of males 25-59*China	-	-	-	-	-0.179*
	-	-	-	-	(0.089)
No. of females 25-59*China	-	-	-	-	-0.189
	-	-	-	-	(0.098)
Urban Interaction Variables					
Any birth*Urban	-	0.177	0.251	-	-
	-	(0.147)	(0.155)	-	-
Children 0-15*Urban	-	-	0.368**	-	-
	-	-	(0.073)	-	-
No. of males 15-24*Urban	-	-	0.104	-	-
	-	-	(0.079)	-	-
No. of females 15-24*Urban	-	-	0.217*	-	-
	-	-	(0.086)	-	-
No. of males 25-59*Urban	-	-	-0.081	-	-
	-	-	(0.104)	-	-
No. of females 25-59*Urban	-	-	-0.040	-	-
	-	-	(0.111)	-	-
Constant	-1.848**	-1.634**	-1.559**	-1.666**	-1.669**
	(0.106)	(0.110)	(0.114)	(0.111)	(0.108)
Observations	11463	11463	11463	11463	11463
Pseudo R-squared	0.13	0.09	0.10	0.09	0.10
Wald Chi sq	908.08	669.96	686.21	673.87	762.57
Log likelihood	-6725.079	-7022.08	-6996.07	-7022.27	-7002.05
BIC	-93506.19	-92893.49	-92898.78	-92893.1	-92886.81

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%
Omitted categories for dummy variables are Region (Inland/North), Rural, and Country (Vietnam)

Appendix Table A6: Pooled Logistic Regression Analysis: The Determinants of Household Involvement in Wage Employment in the Red River Delta, Vietnam and China

	Model 1	Model 2	Model 3	Model 4	Model 5
Context Variables					
Country - China	1.007**	1.320**	1.339**	1.366**	1.311**
	(0.084)	(0.104)	(0.104)	(0.107)	(0.156)
Urban	0.514**	0.630**	0.311	0.622**	0.603**
	(0.097)	(0.132)	(0.200)	(0.129)	(0.130)
Region (Coastal/South)	0.253**	0.331**	0.338**	0.323**	0.333**
	(0.091)	(0.109)	(0.109)	(0.110)	(0.110)
Region (Mountains)	0.141	0.191	0.191	0.190	0.187
	(0.103)	(0.121)	(0.122)	(0.120)	(0.121)
China*Urban	-	0.177	0.151	0.177	0.203
	-	(0.173)	(0.181)	(0.171)	(0.174)
HH Variables					
Any birth between surveys	-0.067	-0.078	-0.041	0.007	-0.004
	(0.071)	(0.077)	(0.077)	(0.089)	(0.091)
No. of children < 15	-0.093**	-0.142**	-0.139**	-0.146**	-0.179**
	(0.027)	(0.027)	(0.031)	(0.027)	(0.038)
No. of males 15-24 in household	0.163**	0.100*	0.153**	0.101*	0.073
	(0.039)	(0.040)	(0.044)	(0.040)	(0.053)
No. of females 15-24 in household	0.049	0.014	0.009	0.014	0.008
	(0.037)	(0.038)	(0.042)	(0.038)	(0.047)
No. of males 25-59 in household	0.278**	0.311**	0.245**	0.313**	0.328**
	(0.053)	(0.053)	(0.060)	(0.053)	(0.063)
No. of females 25-59 in household	0.123*	0.170**	0.100	0.175**	0.195**
	(0.060)	(0.062)	(0.070)	(0.061)	(0.067)
No. of males & females 60-69 in household	-0.164**	-0.110*	-0.111*	-0.110*	-0.110*
	(0.049)	(0.049)	(0.049)	(0.050)	(0.050)
No. of males & females 70+ in household	-0.223**	-0.202**	-0.198**	-0.202**	-0.202**
	(0.052)	(0.054)	(0.053)	(0.054)	(0.055)
HH Socioeconomic Status					
Household has any member with Upper Sec. School	0.585**	0.691**	0.687**	0.689**	0.687**
	(0.056)	(0.054)	(0.055)	(0.054)	(0.054)
Household Wealth Index	0.115**	0.132**	0.130**	0.134**	0.133**
	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)
Household Possesses Flush Toilet	0.209*	0.386**	0.379**	0.380**	0.382**
	(0.094)	(0.099)	(0.100)	(0.099)	(0.099)
Household Possesses Earthen Floor	-0.149*	-0.294**	-0.302**	-0.293**	-0.298**
	(0.072)	(0.081)	(0.080)	(0.080)	(0.080)
Household Possesses a TV	-0.162	-0.099	-0.085	-0.100	-0.100
	(0.083)	(0.083)	(0.082)	(0.082)	(0.082)
Household Possesses Motorized Transport	-0.198*	-0.257*	-0.260**	-0.260**	-0.260**
	(0.099)	(0.100)	(0.100)	(0.099)	(0.099)
Household had this Economic Activity at Time One	1.636**	0.009	0.012	0.014	0.011
	(0.076)	(0.088)	(0.088)	(0.088)	(0.089)
Country Interaction Variables					
Any birth*China	-	-	-	-0.272*	-0.230
	-	-	-	(0.133)	(0.141)
Children 0-15*China	-	-	-	-	0.074
	-	-	-	-	(0.052)
No. of males 15-24*China	-	-	-	-	0.078
	-	-	-	-	(0.079)
No. of females 15-24*China	-	-	-	-	0.017
	-	-	-	-	(0.079)
No. of males 25-59*China	-	-	-	-	-0.023
	-	-	-	-	(0.099)
No. of females 25-59*China	-	-	-	-	-0.050
	-	-	-	-	(0.113)
Urban Interaction Variables					
Any birth*Urban	-	-0.048	-0.256	-	-
	-	(0.175)	(0.181)	-	-
Children 0-15*Urban	-	-	-0.021	-	-
	-	-	(0.071)	-	-
No. of males 15-24*Urban	-	-	-0.323**	-	-
	-	-	(0.095)	-	-
No. of females 15-24*Urban	-	-	0.039	-	-
	-	-	(0.113)	-	-
No. of males 25-59*Urban	-	-	0.275*	-	-
	-	-	(0.120)	-	-
No. of females 25-59*Urban	-	-	0.287*	-	-
	-	-	(0.120)	-	-
Constant	-2.594**	-2.233**	-2.143**	-2.264**	-2.234**
	(0.118)	(0.121)	(0.126)	(0.122)	(0.123)
Observations	11490	11474	11474	11474	11474
Pseudo R-squared	0.30	0.22	0.23	0.22	0.22
Wald Chi sq	1725.07	1023.60	1107.78	1032.80	1128.14
Log likelihood	-5577.858	-6131.49	-6116.2	-6128.98	-6127.24
BIC	-96079.98	-94788.48	-94772.31	-94793.48	-94750.23

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%
Omitted categories for dummy variables are Region (Inland/North), Rural, and Country (Vietnam)

Survey Design and Data Collection Information

The Vietnam Longitudinal Survey (VLS)

The VLS examines three core provinces of the Red River Delta in northern Vietnam. The study provinces are intersected by Highway One, which links North and South Vietnam and acts as an important conduit for the flow of information and commerce. The VLS utilizes a stratified random sample of households, with households randomly selected from village-commune strata defined according to their distance from regional highways, thereby capturing households located at different points along the rural-urban continuum. From among the 471 enumerated rural and urban communes within the study province (Ha Nam Ninh[1]), communes were selected within strata according to probabilities proportional to the total number of households in the province. The 1995 baseline survey thus included 1,855 households in 10 communes (7 villages and 3 town districts) of the study area province. The VLS was designed and conducted by faculty, students and staff at the University of Washington's Center for Studies in Demography and Ecology, and Hanoi's Institute of Sociology (a branch of Vietnam's National Center for the Study of Humanities and the Social Sciences).

The Vietnam Living Standards Measurement Survey (VNLSS)

The second source of data we draw upon in the comparative approach derives from both waves of the Vietnam Living Standards Survey (VNLSS). These data were collected by the General Statistical Office of the Socialist Republic of Vietnam collected these data in 1992-93 and 1997-98 in consultation with the World Bank and with assistance from the United Nations Development Program and Swedish International Development Association (SIDA). The VNLSS is a comprehensive household survey that is nationally representative of Vietnam. It provides information on household composition, education, employment, health and socio-economic status of all household members. So far, two waves of data have been collected. The first wave of data collection was completed in 1992-93 and included a total of 4,800 households. The sample in 1992-93 was a self-weighted sample drawn from provinces across Vietnam's eight regions. Stratifying all of Vietnam's communes/wards according to their urban/rural designation, a random sample of rural communes and urban wards was selected from the two strata, with selection proceeding so as to include an even spread of communes across all of the country's provinces. We also use data from the second wave of data collection in 1997-98, a nationally representative sample of 6,000 households that covers approximately 80% of which are original households surveyed in 1992-93 as well as 1,200 additional households that were surveyed only in 1997-98 (Scott 1997). Our analysis is restricted to the 4, 300 households sampled in both waves of data collection. These households are located in both urban and rural parts of the country and from each of country's eight regions, namely, the Northeast, Northwest, Red River Delta, North Central Coast (which are aggregated to constitute the broad Northern region classification), and the South Central Coast, the Central Highlands, the South east and Mekong Delta regions, which together constitute the Southern region (World Bank 2001).

The China Health and Nutrition Survey (CHNS)

The third source of data we draw upon is the China Health and Nutrition Survey (CHNS). It is a collaborative project between the Carolina Population Center and the China Academy of Preventive Medicine. The CHNS is a longitudinal survey of households in eight provinces of China: Guangxi; Guizhou; Henan; Hubei; Hunan; Jiangsu; Liaoning; and Shandong. Three of the provinces are coastal;

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[1] Following the first year of data collection, a national shift in administrative boundaries created a subdivision of this province into three: Nam Ha, Nam Dinh, and Ninh Binh. This subdivision did not compromise follow-up and the subsequent data collection efforts.

three are in central China; and two are mountainous southern provinces. These provinces span a range of characteristics, although they were not selected according to a probability design. Their population together accounts for roughly a third of China's population and varies substantially in level of economic development. A multistage cluster design was used in the survey. The initial primary sampling units include 32 urban neighborhoods, 32 township neighborhoods, 30 suburban villages, and 96 rural villages. A sample of 3,780 households was drawn in 1989 and followed up in 1991, 1993, 1997, and 2000.[1]

Notes on Sample Size and Attrition

The Vietnam Longitudinal Survey

After three years of annual follow-up surveys, of the 1,855 original 1995 households, in 1998 the VLS staff located and re-interviewed the members of 1,752 original households. The loss to follow-up of nearly 100 households may introduce a degree of selectivity into the longitudinal analysis of household economic activity. Preliminary sensitivity analyses demonstrate that, based on the 1995 baseline survey, the households lost to follow-up were slightly more urban, with greater wealth and assets, and less likely to be engaged solely in agriculture. Many of the households lost to follow-up had no economic activity in 1995, were smaller than average (with 1-2 members) and contained a substantial number of members over age 60, suggesting that the households dissolved as a result of one or more household members' death or migration. In light of these sample differences across the data panels, we proceed with the longitudinal analyses, including only those households that appear in both the 1995 and 1998 surveys (N=1752).

The Vietnam Living Standards Measurement Survey (VNLSS)[2]

The approach followed in conducting the 1998 survey was to return to the 1993 dwellings. Households that moved locally were followed but those that left the community were not tracked resulting in a panel of non-migrant households. The 1998 survey contains 4,301 of the original 4,800 households – 90% follow up. The remaining 10% are 1993 households that moved non-locally, 96 households in enumeration areas that were intentionally not resurveyed, refusals (which were few) and households that ceased to exist. Therefore, 403 households from the baseline sample of 4,704 households dropped out of the sample in 1998. The three regions with the highest rates of attrition are the Southeast (13%), Central Highlands (11%), Mekong Delta (12%). The 1993 per capita expenditure of migrant households (those not followed in 1998) was 31% higher than the 1993 household per capita expenditure of households that were followed up. These households are less likely to be living below the poverty line in 1993, less likely to be farming and more likely to reside in an urban area. So the 1998 households are expected to be less representative of richer households. Panel households are more likely to be rural and have slightly higher poverty rates and lower mean PCE. The smallest households (1 and 2 persons) are significantly less likely be reinterviewed. Overall, households not reinterviewed were richer, younger, and better educated than those in both panel waves.

The China Health and Nutrition Survey (CHNS)

The CHNS consists of several waves of data collection, which began in 1989, when a sample of 3,780 households was drawn, and subsequently followed up in 1991, 1993, 1997, and 2000.[3] In this paper, we use data from 1993 and 1997, thereby establishing a four-year interval for assessing changes in household

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[2] Details on sample attrition patterns are described in: Beegle, Kathleen. 2000. "Economic Mobility in Indonesia and Vietnam: What Missing Data Can't Tell Us." (Unpublished Manuscript).

[3] In 1997, Liaoning dropped out of the survey and was replaced by another Northeastern province, Heilongjiang.

economic activity. With the longitudinal design of the CHNS, substantial numbers of households were lost to follow-up. Specifically, between 1989 and 1993 18% of households (n=684) were lost to follow-up, and between 1993 and 1997 28% of households (n=857) were lost to follow-up. Approximately half of households lost to follow-up were located in Liaoning province, which was dropped from the study between the 1993 and 1997 waves. While we have yet to conduct extensive sensitivity analyses, preliminary assessments of the sample at the 1993 and 1997 data collection points suggests that urban households, as well as those featuring wage workers, and those that were diversified, have disproportionately dropped out of the analyses over time. Removing the cases lost to follow-up from our analyses, we are left with 2,277 households in our analytical sample.

Note on Construction of the Household Wealth Index: Common to the VLS, VNLSS and CHNS are data on household ownership of several consumer durable goods. We use this data to calculate a composite index of household wealth based upon households' ownership of a subset of widely consumed items that indicate a relatively modern, comfortable way of living. Specifically, we designate a score for each item (weighing expensive items more heavily), and then count the items and associated points to derive a household wealth index. The consumer durable items and scoring used in the household wealth index are as follows: Refrigerator: 3 points; Sewing Machine: 2 points; Television: 2 points; Video Recorder: 1 point; Cassette player: 1 point; Radio: 1point; Bicycle: 1 point; Motorbike: 3 points; Automobile: 4 points.