ESSAYS IN INTERNATIONAL ECONOMICS

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PREFACE

The global market is increasingly becoming more integrated, and in recent year international trade has constituted a large proportion of the world's total GDP. I study three different, although sometimes related, aspects of international economic issues. First of all, the financial crisis of 1997-1998 in Indonesia – while different in many characteristics – is similar in a number of aspects to the subprime crisis in the U.S. a decade later. By analyzing the data from Indonesia about housing consumption patterns and asset allocation at the micro level, we can get valuable insights about whether the depreciation and volatility of housing assets have negative effects on household's consumption and asset allocation. Secondly, I examine the effect of social value in terms of trust on exports through financial channel. Exports may be limited by a country's level of financial development level but trust can work as a proxy for informal credit resources and supplement formal credit resources to reduce financial constraints. Thirdly, alternative measures of financial reforms are employed to show that the effects of individual reforms measures on exports as well as their additional contributions in sectors with different levels of financial dependence and asset tangibility can be different.

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CHAPTER I

HOUSE VALUE FLUCTUATIONS, THE HOUSEHOLDS ADJUSTMENT OF CONSUMPTION AND ASSET ALLOCATION

Abstract

Facing large house value depreciations, how will the households adjust allocation of assets and their expenditures? We look for evidence in Indonesia over the period 1993 and 2007, which faced a major economic crisis in 1997-1998. We use the Indonesia Family Life Survey (IFLS) to study urban homeowners to test if large house value fluctuations contribute to changes in household consumption patterns or asset allocation. We distinguish the rate of return on housing assets into two categories: appreciation and depreciation. To eliminate the error in self-report housing value, we predict the house price based on its location, characteristics, etc., in the first stage. The estimation results do not provide significant evidence to claim that household's consumption and allocation would be changed in case of depreciation of housing assets. Due to some similarities between the subprime financial crisis in the U.S. and the economic crisis that took place a

decade ago in Indonesia, these analyses may provide some insights into the adjustment processes that are likely underway, or expected in the near future in the U.S. economy.

I. Introduction

A multitude of household's consumption and asset allocation decisions depend on the value of its housing asset holdings. As wealth increases, households are likely to consume more normal goods (Bostic, Gabreil and Painter 2009). Most studies find that when asset values appreciate, the household chooses to consume certain part of the premium – the marginal propensity to consume – which may be different across different types of assets.[1] Marginal propensity to consume on housing assets is argued to be higher than other types of assets. Bostic, Gabreil and Painter (2009) find that the elasticity of consumption with respect to housing assets is almost three times of the one of financial wealth. As a result, compared to other assets, the volatility of housing price is more likely to affect household consumption level and asset portfolio.

Leonerd (2010) argues that there are two channels thorough which housing wealth appreciation increases consumption: first, households may view the appreciated housing wealth as substitution for current income, in which case the increased income will raise consumption. Second way is by converting the rising house value into cash to finance consumption. Haurin and Rosenthal (2006) show that following the house price appreciation, people begin to adjust their expenditure to consumer part of the increased amount of house values. Usually the appreciation part can be gained either by acquiring more debt, or by buying financial assets, though the latter way actually shows little response to the extra house capital gains. They also find that households will spend 15 cents to finance consumption as 1 dollar increases of house assets on average.

[1] Dvornak and Kohler (2007) study of Australian housing market shows that households spend 6-9 more cents on consumption due to $1 permanent increase in stock market wealth, and 3 more cents due to the same increase in housing wealth. In U.S., one dollar increase in housing wealth brings 10 cents extra spending on consumption while the same in increase in financial wealth only brings an increase of 2 extra cents (Leonerd, 2010).

Additionally, since households tend to hold the assets with higher rates of return and lower risk, and also since households prefer to holding a larger share of the assets with larger marginal propensity to consume (Benjamin, Chinloy and Jud, 2004), house value appreciation also encourages households to hold a larger share of housing assets in their portfolios. Dusansky and Koc (2007) show that when housing price increase, the owner-occupied housing demand curve would be upward sloping curve if treating housing assets as investment asset.

The existing studies of the effects of house value changes on consumption and asset holdings typically studied the situation where house values increased. Haurin and Rosenthal (2006), Benjamin, Chinloy and Jud (2009), Dvornak and Kohler (2007) report their results based on housing value appreciation. While we should also expect such adjustments in response to a house value decline, there is no a priori reason to believe that these effects are going to be symmetrically opposite to those of house value appreciation. Furthermore, the latest housing market crisis in the U.S – which has taken the center stage in the recent debates – brought in large house price depreciation. A study of the implications of house price fluctuation on household consumption and asset allocation, therefore, needs to include house value depreciation.

There are a number of potential reasons to expect asymmetric impacts of house value appreciation and depreciation. First, the marginal effect of increased wealth on consumption may differ from that of decreased wealth; habit formation, preference for consumption smoothing, etc., may create a downward rigidity in at least some types of consumption goods. In case of asset holdings, since housing is also a durable consumption good – and the fact that investing in housing assets is often subject to

indivisibility and irreversibility – the marginal effect of house value decreases on the household's portfolio composition may be different from that of a house value rising up. This paper addresses the above issues using a large household sample from Indonesian (Indonesia Family Life Survey, IFLS 1993-2007).

An additional motivation for this study is gaining understanding of the latest financial crisis in the U.S. During the time interval 1993-2007, our period of analysis, Indonesia witnessed one of the worst financial and economic crises of recent decades followed by a full recovery. Its GDP growth rate keeps rising from a severe drop in 1998, and reaches 6.28% in 2007 though it is still lower than 7.82% in 1996. The collapse of exchange rate system is one of main consequences of the financial crisis in Indonesia. After switching to floating exchange rate, the local currency unit per USD generally falls into the internal between 7800 to 11,000 Indonesia rupiah (IDR) per USD, which is much more stable compared to the period from 1997 to1998 during which period the exchange rate jumped from 2900 to 10,000 IDR per USD. In Table 1.1, we report some of the key numbers of housing and consumption movement from the sample. We observe large procyclical fluctuations in house values and consumption patterns. The corresponding numbers for the U.S. during the subprime crisis are similar.[2] Although the reasons triggering financial crises in the two countries (Indonesian in 1997-1998 and the U.S. in 2008) and the nature of the fallout are not exactly the same, we may still gain some valuable insight into the current U.S. housing market turmoil.[3]

[2] We discuss these in detail in section II.
[3] We discuss some of the similarities and difference in these two cases in section II.

We study household consumption and asset allocation of urban homeowners in Indonesia.[4] The economic conditions in Indonesia over our period of analysis witnessed significant ups and downs. Indonesia was known as one of emerging market success stories in Southeast Asia before 1997. From the mid-1960s to the mid 1990s, it was regarded as one of the eight economic miracles by the World Bank. From 1990 to 1996, the GDP growth rate was averaging 8%; the average unemployment rate was as low as 3.9%. In the middle of 1997, IDR collapsed by the attack of speculators and the financial crisis was triggered. In 1998, GDP growth rate fell dramatically to as low as -13.1%. Meanwhile, 23.4% of the population was drawn under the poverty line, which was doubled of that in 1996 (11.3%). The house price also declined during the financial crisis. Since 1998, the change of housing price in real value was rapidly falling reaching as low as -40% in 1999. After the most severe period, the housing price gradually recovered. The Residential Property Price Index (RPPI) which shows the price of all types of dwelling houses in big cities performs continuously increasing since 2002. Until the fourth quarter of 2007, RPPI is up to 148 (2002 Q1=100). The large swings in the economy, especially in the housing market, makes Indonesia for the period 1993-2007, an ideal candidate for studying effects of house the housing market fluctuations on household decisions regarding consumption and asset allocation.

The starting point of our analysis is the widely used Merton (1969) optimal portfolio allocation model with three types of assets – housing asset, non-housing assets and risk-free assets. This yields two types of equations: (a) consumption as a function of

[4] We only focus on the urban households for two important reasons. First, the property rights in the rural areas of a developing country such as Indonesia are poorly defined at best, rendering itself to any analysis involving house value changes of little meaning. Secondly, on average, the value of housing wealth takes more than 50% of the total assets for families living in cities.

asset returns and volatility, and some household characteristics, and (b) asset shares as functions of asset returns and volatility, and some household characteristics.

In carrying out these estimations, we face two data problems. First, the house values are self-reported. In a developing country like Indonesia where the financial markets are not well-developed, self assessment is not likely to be as accurate as those in the developed countries. Therefore, we use a 2-stage estimation process where in the first stage we predict the house values using all household and location characteristics and detailed house characteristics that are available in the IFLS (e.g., type of house, rooms, materials used, other feature, etc.). The house characteristics are also our exclusion restriction in second stage.

The second complication we face is that, in reporting their net worth, households under-reported their debts. In Merton model, the standard assumption is that households borrow at risk free rate. In the spirit of this assumption, we estimate the household's risk-free asset holdings using a variety of household characteristics (demographic, financial, etc.) and use the predicted values to calculate the asset shares. Tobit model is applied to predict the probability that a household has debts. We also use a linear prediction for the value of risk-free assets of the household. We use the debt probability and predicted risk-free asset values in the second stage where we carry out the estimation of the consumption and asset share models.

We estimate the consumption equation for each of the following consumption expenditures: food, non-food, medical, education, and others.[5] Since we are particularly

[5] Bostic, Gabriel & Painter (2005) find that house values are more important for non-durable consumption and financial assets are more important for durable consumption, possibly due to the fact that increase in house values are thought to be more permanent and households may change their non-durable consumption patterns in response to such changes.

interested in possible asymmetric effect of house value appreciation and depreciation, we create two separate variables to distinguish the direction of change of housing asset value. Exploiting the panel nature of the sample we use household fixed effects to account for any bias that may arise from (time-invariant) unobserved heterogeneity. We do not find a measureable effect of house value appreciation or depreciation on consumption.

The asset share equations (one for housing assets and the other for non-housing assets) are simultaneous equations with each share appearing in the equation of the other. We use three stage least squares (3SLS) to estimate the effects of house value appreciation and volatility. 3SLS regression helps to estimate a system of simultaneous equations in which the dependent variables could be the explanatory variables in other equations. Since endogenous variables are on the right-hand-side in some structural equations, it will lead to the problem of error correlation among equations. To reduce the correlated errors, endogenous variables will be instrumented by all exogenous variables first, then being replaced on right-hand-side of equations by predicted instrumented value and covariance matrix.

In what follows, in section II we discuss the literature on three issues relevant for this study: house value fluctuation and household behavior, the Indonesian economy during the study period, and the recent U.S. housing crisis. In section III we discuss the data and in section IV the theoretical motivations. Section V has the estimation strategy and the results. Section VI concludes.

II. Literature Reviews

House Value Fluctuation and Household Behavior

Haurin & Rosenthal (2006) find a positive relationship between house price appreciation and consumption. People consume part of their housing assets premium. Benjamin and Chinloy (2008) have similar conclusions. They claim that, for the households in the U.S., borrowing from assets can increase the cash and debt simultaneously with net wealth unchanged. By refinancing housing equity, households are able to get cash to raise consumption expenditure even without lowering net wealth. When interest rate is low and housing value appreciates, households can increase their mortgage level to smooth consumption.

Bostic, Gabriel & Painter (2005) calculate the elasticity of consumption to different types of wealth. Their empirical results illustrate that, the elasticity of consumption to house value is highly significant. Additionally, house values are more important for non-durable consumption and financial assets are more important for durable consumption, possibly due to the fact that increase in house values are thought to be more permanent and households may change their non-durable consumption patterns in response to such changes.

Using time series data in the U.S., Benjamin, Chinloy and Jud (2004) explain why people prefer housing assets over financial assets due to the difference in their respective marginal propensity to consume (MPC). Since housing capital gain has higher MPC, households tend to hold more housing assets than financial assets. In their model, the consumption of housing is netted out of total consumption.

Benjamin and Chinloy (2008) find that by refinancing housing equity, households in the US are able to get cash to raise consumption expenditure even without lowering net wealth. They also claim that consumption is determined by the net wealth instead of

assets level. Therefore, when interest rate is low, households can increase their mortgage level to smooth consumption.

If a household is liquidity-constrained, refinancing becomes a financial buffer. For example, under negative income shocks, households would use part of their housing assets to smooth their consumption (Hurst, 2004). If a household with low level of liquid assets experienced an unemployment shock, the owner has 25% more probability to refinance than other households.

The Case of Indonesia

The general conclusion of several papers that studied the impact of financial crisis in Indonesia is that the crisis lowered households' standard of living. Compared to the survey data in 1997 and 1998, both per capita expenditure (by 25%) and total expenditure (by 10%) for household decreased after the crisis. For both rural and urban families, the share of food budget in total expenditure increased rapidly owing to price rise and also investment in human capital was reduced. Real wage declined by 40% for urban workers which doubled the decline for rural labors (Thomas and Frankerberg, 2005). Households had to spend some of their assets in order to meet consumption requirement when both income and wealth were reduced; gold was traded frequently to compensate the decline in income during this period. In households' assets portfolio, the weight of real estate fell (Frankerberg, Smith and Thomas, 2003).

To analyze who have been hurt the most, Friedman and Levinsohn (2002) adopted a methodology to analyze the impact of the crisis on household welfare. They find that the urban poor fared the worst because they did not possess farm land to provide

basic food consumption, the price of which nearly tripled after the crisis. Urban households thus may have had a greater incentive to adjust their housing assets to smooth consumption.

The financial crisis not only brought significant changes in the exchange rate in Indonesia, but it also totally disrupted the mortgage market. New mortgage loans generated by banks did not resume until 2003 (Hoek-Smit, 2005). The commercial banking system was severely affected during the crisis. The total outstanding credit of commercial banks dropped from nearly 500,000 billion IDR, to a little above 200,000 billion IDR in 2000. Banks lost the capability to perform their roles in the financial market until 2004, when the credits started to rise. The failure of the mortgage market is evident from the total mortgage credits as a percentage of GDP: in 1997, right before the crisis, the rate was 3.12% and in 2000 it was only 1.23% and stayed at a low level until 2004. All these indicate to a scenario that households may have been unable to consume their housing assets by refinancing. Note that since the beginning of the crises, for a long period of time, the U.S. witnessed a credit freeze.

The Housing Market Crisis in the U.S.

Certainly the Indonesian economy is vastly different from that of the U.S. It, however, incumbents upon us to at least compare the two economies side by side. No matter where it happens, do the behaviors of the financial crises share some essential communality? After the burst of the subprime crisis in U.S., Reinhart and Rogoff wrote a series of papers to discuss and compare the financial crises of the past. From the sample of 66 countries belonging to either high-income or middle income economies, they find

that there were little differences in frequency, duration and quantitative measures of the financial crises that were experienced by the countries in these two groups. Reinhart and Rogoff (2008) states that, even though these two groups perform quite differently from a macroeconomic standpoint, the banking crises in rich countries and emerging markets still share many aspects in common. The amplitude of the decline in real housing price and real equity price, as well as the duration of the decline, are similar among observed countries.

The average peak-to-trough decline of real housing price is up to 35% and would last around six years following the crash (Reinhart and Rogoff 2009). In Indonesia the decline persisted after five years and was up to 40% (Reinhart and Rogoff 2009). The U.S. experiences almost 28% decline to date (Dec. 2010) since May 2007. Aside from the decline in housing price, some other economic indicators also showed similar movements: the increase of the unemployment rate and the decline in real GDP per capita, for instance. The duration of unemployment is relatively shorter in emerging market economies whereas the extent of GDP decline is smaller in advanced economies. And finally, the collapse in tax revenues drives the government debt to rise rapidly. Based on the these observations, the authors conclude that both the rich countries, like the U.S, and the developing countries, such as Indonesia, face "an equal opportunity menace" in the "aftermath of financial crises". After 2000, the housing market in the U.S. entered a period of boom. With the development of the subprime mortgage market and other financial innovations, more households, especially those with lower credit scores, had a chance to buy a house with little down payment. Meanwhile, the increasing house price showed that housing assets became a more profitable and less risky component of the

households' asset portfolio. The housing demand was pushed to a high level and a persistent housing price increase was observed with an annual growth rate of 8.2% until 2007.

Since July 2007, the house prices started to decline sharply millions of houses faced the foreclosure. When the housing bubble finally burst, a subprime crisis ensued. Meanwhile, the total real personal consumption expenditures started declining after sustained increase for several years. The quarterly percentage changes show that personal consumption expenditures declined gradually.

By analyzing the previous financial crisis in Indonesia in 1997 to 1998, we could gain valuable insight into current and upcoming U.S. economic situation.

III. Data

We use Indonesia Family Life Survey (IFLS) to estimate the movement of consumption and asset allocation in household level. As a longitudinal survey, it starts in 1993, and resurveyed in 1997, 2000 and 2007, representing nearly 83% of the Indonesian population. The IFLS is a comprehensive multipurpose survey that contains detailed demographic, economic and financial information.

Generally, the assets are divided into two categories: business assets and household assets. Business assets (classified as farm and non-farm businesses) are the resources used in production activities, from which the households can earn income. There are two types of non-business assets: housing and non-housing assets. The housing assets are defined as the family's dwelling house in which the family members are currently residing. Non-housing assets include all other assets that are used neither for

business purpose, nor for owner-occupation. They are identified as financial assets, other housing assets, jewelries, farm assets not used for business, vehicles, etc.

As is true in many other developing countries, Indonesian households hold a significant amount of non-housing, non-financial assets. On the average, over the four waves, the share of financial assets (defined as savings, certificate of deposit, etc.) is as small as 1.64% for urban households. Considering the active gold trade in Indonesia, it is necessary to take into account the value of jewelries which includes noble metals, gems, etc. We view jewelry as a form of risk free asset due to the informal nature of Indonesian economy and its underdeveloped financial system.[7]

Homeownership is not always well-defined in Indonesia, neither is a home. We keep in our sample only urban households since the property rights are better defined in the urban areas. Also, we only include households whose homes are well-defined in terms of their physical structure. We use the housing characteristics to define a house. For instance, a dwelling that does not have running water, sewage and hard-roof is not considered as a house.

The upper part of Table 1.2 presents the shares for different types of assets for households in the four waves. All values are real values with base year=2000. Housing assets are always the most important component of households' total assets, and it is nearly at least 60% in all survey years. The direction of change is not the same across assets. The share of housing assets continually dropped since 1993, but rose significantly in 2007 and almost reached the level before the crisis, when the economy has already

[7] Gold trading is very popular and, in some places, it is easier to have access to a gold trader than a bank. After the financial crisis, gold was one of the few assets that did not collapse. Jewelry are less risky than financial assets especially during volatile periods (Thomas 2005). It is, therefore, reasonable to consider jewelry as an important form of saving. The survey data showed that average share of jewelry is up to 2.7% of the total assets among urban households.

recovered. All other types of assets experienced the increasing first, then decline afterward. Since agricultural production is a traditional industry in Indonesia, people living in urban area also possess some farm business assets in their asset portfolio. The share of farm business assets increased nearly 31.5% after the crisis due to the food price inflation.

We obtain annual expenditure information from the consumption module. Consumption expenditure is the money spent by the household on four types of goods and services, namely, food consumption, non-food consumption, education, medical care. Total and all other non-food consumption are also considered. The second part of Table 1.2 shows the consumption patterns of the urban families. All values are in annual real (base year=2000) expenditures per capita. In general, the consumption patter does not show significant volatility across waves. Food is still a major expenditure for urban households, and it constitutes nearly half of the total expenditure. However, when we look at the absolute value change of the per capita cost on types of expenditures, it shows impressive movement. Food expenditures dropped 12.86% after the economic shock. In fact, the expenditure on all types of consumption declined between 1997 and 2000. People intended to restrict their daily consumption when experiencing severe economic shock. After the recovery in 2007, though food expenditures still failed to catch up the level in 2000, all other types of expenditures experienced the spending increasing, especially the cost of medical care which shifted up by more than 40%. Table 1.1 presents the change of different types of consumption over the 4 waves.

IV. Underlying Model

We use Merton (1969) optimal portfolio allocation model. The household decides on the consumption level and asset allocation to maximize lifetime utility. Consumption decisions are based on accumulated wealth. Total household wealth,

(1) $W = H + NH + R$,

which is the sum of the value of the owner occupied housing assets (*H*), the value of non-housing assets (*NH*), which includes farm business assets, non-farm business assets and non-owner-occupied housing assets, and the value of risk free assets (*R*) that is composed of savings accounts and jewelry. Both housing and non-housing assets are considered risky.

We assume that total household wealth is an Ito process such that,

(2) $dW = \alpha_H H dt + \sigma_H H dz_H + \alpha_{NH} NH dt + \sigma_{NH} NH dz_{NH} + rRdt - cdt$,

where, $\{z_k \mid k = H, NH\}$ are Brownian motions and c represents household consumption. The vector (α_H, σ_H) represents the rate of return on and the volatility of housing assets *H*. Correspondingly $(\alpha_{NH}, \sigma_{NH})$ represents the rate of return on and the volatility of non-housing assets *NH*. Risk free rate of return is *r*. We allow the covariance between the Brownian motions related to the two risky assets to be non-zero and assume the following:

(3.1) $\text{cov}(dz_H, dz_{NH}) = \tau_H(\alpha_H, \alpha_{NH}) \cdot \tau_{NH}(\alpha_H, \alpha_{NH}) dt = \rho(\alpha_H, \alpha_{NH}) dt$,

(3.2) $dz_H = \tau_H(\alpha_H, \alpha_{NH}) dz$,

(3.3) $dz_{NH} = \tau_{NH}(\alpha_H, \alpha_{NH}) dz$.

Denoting the share of the assets H and NH as $w_H = H/W$ and $w_{NH} = NH/W$ respectively, and substitute them into (2) with (3.2) and (3.3), we have,

(4) $$dW = \alpha_H w_H W dt + \sigma_H w_H W \tau_H(\cdot) dz + \alpha_{NH} w_{NH} W dt + \sigma_{NH} w_{NH} W \tau_{NH}(\cdot) dz + r(1 - w_H - w_{NH}) W dt - c dt$$

The household's life time utility is,

(5) $$U(c) = E\int_0^{\infty} e^{-\rho t} u(C(t)) dt, \qquad u(c) = \frac{c^{1-\varphi}}{1-\varphi},$$

in which φ is the constant relative risk aversion parameter. The Bellman equation is,

(6) $$\lambda V = \max_{c, w_H, w_{NH}} \left(\begin{array}{l} u(c) + \left[\{(\alpha_H - r) w_H + (\alpha_{NH} - r) w_{NH} + r\} W - c\right] V' \\ \qquad + \frac{1}{2}\left[\sigma_H w_H \tau_H(\cdot) + \sigma_{NH} w_{NH} \tau_{NH}(\cdot)\right]^2 W^2 V'' \end{array} \right),$$

where, V is the value function with V' and V'' denoting its first and second derivatives with respect to the state variable, respectively. λ is the time discount factor.

The solution takes the form,

(7) $$c = AW,$$

where, A is some constant. We can also obtain closed form expressions of the optimal asset shares,

(8.1) $$w_H = \frac{(\alpha_H - r) - \sigma_H \sigma_{NH} \rho \varphi w_{NH}}{\sigma_H^2 \tau_H^2(\cdot) \varphi},$$

(8.2) $$w_{NH} = \frac{(\alpha_{NH} - r) - \sigma_{NH} \sigma_H \rho \varphi w_H}{\sigma_{NH}^2 \tau_{NH}^2(\cdot) \varphi}.$$

Additionally, in light of (8.1) and (8.2), we recast the consumption equation as,

(9) $$c = f(\alpha_H, \alpha_{NH}, r, \sigma_H, \sigma_{NH}, r, \varphi, A) \cdot$$

We use log-linear approximations of equations (9), (8.1) and (8.2) as our estimation equations. From (8.1) and (8.2), we see that asset shares are determined simultaneously. Our variables of interest are the housing asset variables (α_H, σ_H). We

will examine the reaction of consumption expenditures and share of housing assets (and non-housing assets) in response to housing value appreciation, depreciation and volatility. A description of the variables in these regressions is reported in Table 1.3. Summary statistics are presented in Table 1.4.

V. Estimation and Findings

We calculate house value appreciation (depreciation) and house value fluctuations from the self-reported house values. We believe that this house value is likely to be endogenous for at least two reasons: first, in an economy like Indonesia where the financial institutions are poor, self-reporting can have measurement errors.[8] Secondly, households consumption behavior may be correlated with their reporting of house values due to unobserved characteristics (such as optimism – those who are more optimistic by nature may consume more and report higher house values).

Motivated by the fact that house values vary over the housing characteristics and geographical locations, we device an alternative way to arrive at an estimate of house values. Self-reported house value is regressed on a series of housing character and location variables. The housing characters are collected in detail, and describe the physical condition of houses that are the determining factors of price in the housing market. For example, a house is likely to be valued higher with a well-kept yard and lower with poor ventilation. Also, the number of rooms is an important determinant of price, an extra room may contribute nearly 0.1 million IDR based on our estimation. The location of house is another factor; in our estimation, keeping all other conditions fixed, if

[8] We assume a simple linear measure error structure that can be addressed using linear instrumental variables.

a house is located in the most populous province of Indonesia, West Java, then the average price will be 0.7 million IDR higher than the ones in other provinces. From our first stage of estimation we predict a quality and location adjusted house values. The house characteristics are excluded in the second stage where we estimate the consumption and asset share equations.

The household's reaction to the change in house values may depend on the direction of this change. We, therefore, define the following variables to distinguish house value appreciation from depreciation,

$$(10) \quad \alpha_H^+ = \begin{cases} \alpha_H, & \text{if } \alpha_H > 0 \\ 0, & \text{otherwise} \end{cases}, \quad \text{and,} \quad \alpha_H^- = \begin{cases} \alpha_H, & \text{if } \alpha_H < 0 \\ 0, & \text{otherwise} \end{cases},$$

where, α_H measures the percentage change in quality and location adjusted house values between two adjacent waves of the survey. To calculate the local house values volatility, we calculate the standard deviation of the quality and location adjusted house value at the *Kabupaten* level which reflects the movement of housing price in regencies. There are 99 Kabupatens belonging to 13 provinces.

The level of debts the household carries reflects its attitude towards risk. Debts can also influence the households' portfolio allocation (Becker and Shabani, 2010). However, our dataset did not provide any debt information. In reporting asset values the household under-reported their debts. We assume that households borrow at the risk-free rate and use the self-reported risk-free assets to estimate the following variables: probability of being a debtor; this we use to create a variable called 'debt' indicating the probability of the household's net risk-free holding being negative. We also regress the self-reported risk-free assets values on household's financial and demographic

characteristics and predict risk-free asset holdings. In these two first stage estimations we use variables indicating whether the household is involved in non-farm businesses and farm businesses. These variables are excluded in the second stage where we estimate the consumption and asset share equations. We use these two variables in our second stage estimations.

Consumption Expenditure

We estimate (9) with the following log-linear approximation,

$$\ln c_{it} = \beta_0 + \beta_1 \ln \alpha^{+}_{H,it} + \beta_2 \ln \alpha^{-}_{H,it} + \beta_3 \ln \sigma_{H,it} + \beta_4 \ln \alpha_{NH,it} + \beta_5 \ln \sigma_{NH,it} + \beta_6 \ln r + \mathbf{X}\boldsymbol{\beta}_7 + \eta_i + \varepsilon_{it}, \quad (11)$$

where η_i is the unobserved household characteristics, and ε_{it} is the error term. To proxy for (A,φ), we use a vector **X** of household's demographic characteristics, location variable, and the economic shocks to the household: household size, age, age^2, schooling, female, a location dummy indicating whether the observation is living in the most populous province, an economic shock dummy showing if any household members suffered sickness in the past five years, and probability of debt.[9] We estimate (11) for each of the following six types of expenditure: total expenditure, food or non-food expenditure which is subdivided into additional three categories, medical cost, education cost, and other expenditure except food.

We begin with a set of OLS to estimates of equation (11) under the assumption that $\eta_i = 0$ (Table 1.5). Table 1.6 presents preferred regressions where we allow for $\eta_i \neq 0$ and estimate (11) using household fixed effects. The results are similar to the OLS

[9] We include the 'debt' variable as a proxy for the household's attitudes towards risk that is part of φ.

results. In the fixed effects regressions, when house value appreciates, it has a small negative effect on total expenditure, non food and total non food expenditure. Holding the other factors at their means, if the rate of return increases by 10%, the total expenditure per capita will decline by 0.488%; and the non food expenditure per capita will drop by 0.729%. Even though the effect of positive asset return is ambiguous, the magnitude is relatively small and does not have a remarkable effect on expenditure. The depreciation of the housing asset shows some violation to the non food and total non food expenditure. When housing values depreciate by 10%, households will cut their spending on non food by 0.593%, and total non food by 0.629%. The effect of housing depreciation does not have economically significant effect on expenditure either. In general, the expenditures have little obvious movement when facing the value change of housing assets. The fluctuation of housing assets does not any impressive effect in any cases. Any change of housing assets value, in terms of either rate of return or volatility, does not affect household's normal expenditure in economically significant level. Especially the fluctuation of housing price has no observable impact on consumption level at all. We infer that even though the appreciation and depreciation of house values may affect consuming in some cases, the magnitudes of these effects are not economically significant and, therefore, the collapse of the housing market is not likely to hurt expenditure of the individual household.

The effect of non-housing assets return is significant in five out of six cases. If the non-housing market enters a booming period with more positive return, households would intend to decrease their daily spending especially the cost of education which is nearly 9 times of the decrease of total expenditures. We may assume that the increasing

of risky-asset return stimulates people to put more money into investment instead of spending it. The volatility of non-housing asset shows zero effect on expenditures. People do not take any action on consumption pattern when risky asset market is unstable. However, the return on risky-free assets brings positive impact except medical cost.

The second part of Table 1.8 is the summary of how dependent variables change with one positive standard deviation of corresponding independent variables. The total expenditure per capita will drop more than 25.45 thousand IDR which is around 25.45 USD with the current exchange rate when the independent change is one standard deviation of housing price appreciation.

Our results disapprove by Friedman and Levinsohn (2002)'s finding that urban families may adjust housing assets to help their consumption in case of experiencing crisis.

The household heads' education level is positively related to the consumption. If the heads received at least high school degree, they will spend more, especially on education. The age and gender of households head do not present significant effect on expenditure decisions. For larger families, costs per person are lower than smaller families. Living in the most populated province is not economically significantly expensive. However, probability of owning a debt brings big significant negative impact on consumption. If a household increases its chance to own debt by 10%, their personal spending will be lowered by more than 14%.

We also divide the sample into four quartiles by household's total expenditure and examine if any quartile of total households has special reaction to the change of housing assets' return and volatility. The households in last quartile have negative response of

education costs to the depreciation of housing assets, and the third quartile increase spending in non-food expenditure when housing is appreciated. There is no other significant responses other that those. Table A1.1 of appendix depicts the results.

Asset Allocation

We estimate the following log-linear approximations of equations (8.1) and (8.2), the asset share equations,

(12)

$$\ln w_{H,it} = \beta_0 + \beta_2 \ln w_{NH,it} + \beta_3 \alpha^{+}_{H,it} + \beta_2 \ln \alpha^{-}_{H,it} + \beta_3 \ln \sigma_{H,it} + \beta_4 \ln \alpha_{NH,it} + \beta_5 \ln \sigma_{NH,it} + \beta_6 \ln r + \mathbf{X\beta_7} + \eta_i + \varepsilon_{it},$$

(13)

$$\ln w_{NH,it} = \beta_0 + \beta_2 \ln w_{H,it} + \beta_3 \alpha^{+}_{H,it} + \beta_2 \ln \alpha^{-}_{H,it} + \beta_3 \ln \sigma_{H,it} + \beta_4 \ln \alpha_{NH,it} + \beta_5 \ln \sigma_{NH,it} + \beta_6 \ln r + \mathbf{X\beta_7} + \eta_i + \varepsilon_{it},$$

We test two alternative models. First, we assume $\eta_i = 0$. To account for the simultaneity bias of we employ three stages least square (3SLS) regression for the pair of equations. On RHS, the lagged dependent variables ($\ln w_{H,i(t-1)}$ in equation (12) and $\ln w_{NH,i(t-1)}$ in equation (13)) are added. Our second test is with instrumental variables (2SLS). Here, we allow for $\eta_i \neq 0$ and employ instrumental variables (2SLS) with household fixed effects. We use the lagged values of the corresponding share variables as instruments to capture the effect from previous period. We produce identification tests showing the instruments to be non-weak.

According to the regression results in Table 1.7, neither the appreciation nor the depreciation of housing assets alters the shares of assets with economically insignificant

amount with 3SLS method; but both have positive effect on the share of non-housing assets when controlling fixed effects. In risky-asset market, its positive return will drive the share of housing assets rising by more than 0.78% with both methods; whereas its fluctuation changes nothing. The stability of housing market fails to change the percentage of housing assets. Therefore, after the crash of housing market, we can't observe the obvious change of housing assets in asset portfolio. Paradoxically, if the crash occurs in non-housing market, people would like to hold more shares of non-housing assets instead.

The older household heads may increase the share of non-housing assets but lower housing assets a little bit. And higher-educated heads would like to hold more shares of risky-assets. Finally, it is clear that the substitute effect of one type of assets to the other exists. Holding other variables unchanged, the direction of housing assets change is exactly opposite to non-housing assets.

In households' assets portfolio, the weight of real estate fell (Frankenberg, Smith and Thomas, 2003). We do not find that the factor that contributed to the asset shares reallocation do not include house value fluctuations and volatilities.

VI. Conclusion

A great number of empirical studies show that when facing asset value appreciation people hold more shares of assets with higher rate of return, and increase their expenditure by consuming a fraction of the asset premium, especially housing assets. By studying the case in Indonesia for the period 1993-2007, we intend to test the sensitivity of household's decision regarding consumption and asset allocation in

response to large house value fluctuations. Also, we want to examine if the household's response is symmetrically opposite in case of house value appreciation and depreciation. The regression results show that housing asset value depreciation have little impact on consumption expenditures. Its effect on asset allocation, especially share of housing assets, is not economically significant. Elasticity with respect to housing asset volatility is positive for total expenditure, food and non-food cost, having no effect for the share of non-housing assets. However, the magnitudes of these elasticities are very small and not economically significant. We conclude that changes in rate of return and volatility of housing asset values are not contributing to changes in household consumption expenditures in any significant way, as well as in the asset allocation.

Since July 2007, house prices in U.S. started to decline sharply. The U.S. National Housing Price Index kept dropping sharply and was as low as 129 in the first quarter of 2009, which is around 30% lower than what it was two years earlier.[10] The quarterly percentage changes show that personal consumption expenditures also declined.[11] Decrease of house values is accompanied by consumption restraint. For most families, housing assets are one of the major components in their asset portfolio. In 2009, the GDP growth rate was only -2.6%, and the unemployment rate as high as 8.9%. In the first quarter of 2010, GDP growth was 3.7% compared to previous quarter and unemployment still remains as high as 9.7%. The economy has clearly not fully recovered. We still would not know for at least some time the full extent of the impact of

[10] The U.S. National Home Price Index in 2007(Q1), 2008(Q1), 2009(Q1) and 2010(Q1) were 184.83, 159.36, 129.18 and 132.10 respectively. Source: S&P/Case-Schiller: 2000Q1=100.

[11] Total personal consumption expenditure in the U.S. rose at a steady average rate of 2.97% between 2001 and 2007. Between 2008(Q1) and 2009(Q1) there was a decline of 2.6%, and within the next year the rate of change was 3.6%. Source: Department of Commerce, Bureau of Economic Analysis (In real values: 2005=100).

the housing market fluctuations on household's consumption and asset allocation decisions in the U.S.

However, given the similarities of the economic crisis in Indonesia a decade ago and the recent crisis in the U.S., these results, at the very least, raises a question as to what extent the collapse of the housing market in the U.S. had a causal effect on the decline in consumer expenditures that we are witnessing in the U.S. Unemployment, consumer confidence, bleak future expectations, all these may have been more prominent contributors to the declining consumer spending. Our study suggests that a causal relationship between house value decline and reduced consumer expenditure in the U.S. is at this point a mere speculation and we cannot be sure unless we have reasonable evidence.

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Table 1.1 Change across the Four Waves in IFLS*

	1993-1997	1997-2000	2000-2007
Percent of houses that saw its value appreciate	67.77	34.39	63.77
Percent of houses that saw its value depreciate	32.23	65.61	36.23
Percentage change in per capita			
total household expenditure	9.00	-21.96	7.98
food expenditure	-1.94	-12.86	-8.51
total non-food expenditure	18.64	-28.58	22.64
education expenditure	-23.01	-30.01	20.29
medical expenditure	14.34	-21.19	45.32
other non-food expenditure	38.02	-28.65	21.75

*N=1135

Table 1.2 Assets allocation and consumption pattern for urban households in IFLS

	1993	1997	2000	2007
Share of Total Assets				
House (%)	66.29	63.15	59.16	65.97
Other household Assets (%)	30.73	34.95	38.54	32.06
Farm Business (%)	4.99	4.38	7.37	4.87
Non-farm Business (%)	4.27	4.48	5.89	4.91
Saving (%)	1.45	1.43	1.92	1.40
Jewelry (%)	1.53	0.47	0.38	0.56
Share of Consumption (EPC)				
Food (%)	52.33	51.68	53.88	46.32
Non-food (%)	31.26	34.66	33.64	40.75
Medicine (%)	2.17	2.55	2.48	2.91
Education (%)	14.23	11.11	10.00	10.02
N *	426	422	506	207

*Only the households continuously joint the survey at least three times were selected in order to maintain the consistency of the dataset. The number of observations in each wave is different because some households did not participate in all four waves of survey. For example, they only fulfilled the first three surveys, or the last three surveys.

Table 1.3 Variable Descriptions

Variables	Description
Age	Age of the household heads. It is restricted between 21 to 75.
Age^2	The square of age.
Female	Dummy variable for female headed household.
Schooling	Dummy variable for education of the household heads. It takes the value of 1 if the head finished high school education.
Appreciation and depreciation of housing assets	House value appreciation $\alpha_{H+} = \alpha_H$, if $\alpha_H > 0$ (zero otherwise), and depreciation $\alpha_{H-} = \lvert\alpha_H\rvert$, if $\alpha_H < 0$ (zero otherwise), where, α_H is the real rate of return on the housing asset. We measure it with the percentage change in real owner occupied house value between two subsequent waves of the survey.
Rate of return on non-housing assets	The average of the past five years' growth rate of Jakarta Stock Exchange.
Rate of return on risk-free assets	The average of the past five years' 12 months real interest rate.
Share of risk free assets	The risk free assets are both the risk free financial assets (saving, deposit, etc.) and jewelry owned by the households.
Share of non-housing assets	The non-housing assets include all business assets and other assets owned by the households, except owner occupied house and risk free assets.
Volatility in the local housing assets market	Volatility of quality and location adjusted house value volatility measure, calculated for each *kabupaten*, which is the regency level lower than province. It captures the volatility of house value at a point in time within a given regency.
Volatility of non-housing assets	The average of the past five years' growth rate of GDP per for the three largest provinces; the average of ten years for other provinces.
Consumption Expenditures	We use six consumption expenditure variables: (a) total household expenditure, (b) food expenditure, (c) total non-food expenditure, (d) education expenditure, (e) medical expenditure, and (f) other non-food expenditure that includes clothing, furniture, etc.
House Characteristics	A series of variable describes the characteristics of house, including the number of rooms in the house, types of house (1unite/1 level, 1 unit/multi-level, 2unit/1evel), whether the house has drinking water, defecation system, sewage drain, garbage dispose, hygienic conditions, ventilation and yard. Such characteristics determine the market value of house.

(continued)

Sickness	Dummy variable for sickness of any householders. It takes the value of 1 if any family member got sick in the past five years.
Household size	Number of adults and children living in the household.
Province	We only use the urban sample because homeownership is not very well defined in the rural areas. The households in our sample come from 13 provinces.
Probability of owning debt	Predicted value that how big the chance is that a household own debt.

Table 1.4 Descriptive Statistics

Variables*	Mean	Std. Dev	Min	Max
LHS				
Total household expenditure**	308.85	344.90	20.31	5480.72
Food expenditure	134.98	105.93	2.07	1108.86
Total non-food expenditure	173.88	300.94	3.14	5365.23
Education expenditure	33.30	59.93	0.00	833.97
Medical expenditure	8.54	31.32	0.00	662.76
Other non-food expenditure	132.03	268.83	2.69	5205.04
Share of housing assets***	0.63	0.26	0.00	1.87
Share of non-housing assets***	0.36	0.25	0.00	1.38
RHS				
House value appreciation***	68.62	519.29	0.00	11694.30
House value depreciation***	-58.01	714.03	-23364.23	0.00
Volatility in the local housing asset market**	4859.87	3303.17	74.46	19211.03
Rate of return on non-housing assets	11.54	13.01	2.00	38.00
Rate of return on risk-free assets	2.76	3.16	0.02	6.83
Volatility of non-housing assets	103.58	24.93	82.83	156.74
Sickness	0.14	0.34	0.00	1.00
Female	0.08	0.27	0.00	1.00
Age	51.82	10.50	27.00	75.00
Schooling	0.39	0.49	0.00	1.00
Household size	6.42	2.45	1.00	15.00
Largest Province	0.25	0.43	0.00	1.00
Housing asset value	6678.95	7805.50	10.00	85000.00
Non-housing asset value	5779.60	11928.28	2.00	183350.00
Predicted risk-free asset value	402.97	1498.31	-4136.92	28112.38
Probability of owning debt	0.66	0.16	0.00	0.97

*N=1135, Year=1997, 2000, 2007

**All expenditures per capita, asset value and volatility of housing asset are in terms of 10,000 IDR. All values are inflation adjusted using the GDP deflator (2000=100, source: IMF)

***The asset shares, housing returns in the estimation are from prediction values.

Table 1.5 Expenditure OLS Regression

VARIABLES	(1) Total Expenditure	(2) Food Expenditure	(3) Non Food Expenditure	(4) Education Expenditure	(5) Medical Care Expenditure	(6) Other Non Food Expenditure
α_H^+	-0.0954***	-0.0683***	-0.127***	-0.108	-0.229***	-0.129***
	(0.0142)	(0.0158)	(0.0231)	(0.0984)	(0.0766)	(0.0223)
a_H^-	-0.0498***	-0.0370**	-0.0817***	-0.155	-0.0507	-0.0770***
	(0.0160)	(0.0169)	(0.0238)	(0.0997)	(0.0781)	(0.0250)
α_{NH}	-0.0329	-0.108***	0.0527	-0.213	0.488***	0.0722*
	(0.0298)	(0.0288)	(0.0388)	(0.204)	(0.188)	(0.0415)
R	0.0422***	0.0471***	0.0323	0.168**	-0.330***	0.0207
	(0.0131)	(0.0150)	(0.0202)	(0.0804)	(0.0937)	(0.0204)
σ_H	0.129***	0.0869***	0.191***	0.195	0.0878	0.189***
	(0.0234)	(0.0251)	(0.0319)	(0.169)	(0.150)	(0.0286)
σ_{NH}	-0.199	-0.123	-0.221	0.364	0.695	-0.220
	(0.125)	(0.119)	(0.151)	(0.666)	(0.752)	(0.182)
HHsize	-0.0719***	-0.0682***	-0.0690***	0.306***	-0.0165	-0.0768***
	(0.00729)	(0.00736)	(0.0101)	(0.0533)	(0.0411)	(0.0108)
Largest Province	-0.0845*	-0.00239	-0.124**	-0.0599	0.341	-0.122*
	(0.0502)	(0.0494)	(0.0627)	(0.284)	(0.286)	(0.0639)
Age	0.0237	0.0231	0.0286	0.104	0.0996	-0.00267
	(0.0155)	(0.0169)	(0.0190)	(0.103)	(0.0930)	(0.0184)
Age^2	-0.000293**	-0.000293*	-0.000357*	-0.00259**	-0.000752	-3.88e-05
	(0.000143)	(0.000161)	(0.000182)	(0.00102)	(0.000865)	(0.000174)
Schooling	0.250***	0.198***	0.320***	0.801***	-0.315	0.326***
	(0.0421)	(0.0451)	(0.0547)	(0.269)	(0.280)	(0.0665)
Female	0.0552	-0.0115	0.0414	-1.088*	-0.595	0.103
	(0.0843)	(0.0806)	(0.111)	(0.605)	(0.403)	(0.124)

(continued)

Sickness	0.00332	-0.0740	0.0255	-0.179	1.807***	-0.107
	(0.0684)	(0.0626)	(0.0730)	(0.331)	(0.319)	(0.0757)
Debt	-1.414***	-0.595***	-1.997***	-2.138**	-2.103***	-1.983***
	(0.169)	(0.131)	(0.229)	(0.902)	(0.596)	(0.242)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.325***	4.527***	3.749***	-2.244	-8.025	4.150***
	(0.907)	(0.842)	(1.037)	(5.613)	(5.181)	(1.200)
Observations	1135	1135	1135	1135	1135	1135
R-squared	0.374	0.230	0.371	0.257	0.065	0.343

Bootstrapped standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 1.6 Expenditure Fixed Effect Regression

VARIABLES	(1) Total Expenditure	(2) Food Expenditure	(3) Non Food Expenditure	(4) Education Expenditure	(5) Medical Care Expenditure	(6) Other Non Food Expenditure
α_H^+	-0.0488**	-0.0227	-0.0729***	-0.105	-0.154	-0.0815**
	(0.0199)	(0.0204)	(0.0264)	(0.132)	(0.148)	(0.0339)
a_H^-	-0.0215	-0.000525	-0.0593**	-0.203	-0.0514	-0.0629**
	(0.0211)	(0.0185)	(0.0256)	(0.126)	(0.127)	(0.0300)
α_{NH}	-0.139***	-0.194***	-0.0816*	-1.296***	0.448*	-0.0163
	(0.0330)	(0.0454)	(0.0470)	(0.260)	(0.257)	(0.0472)
R	0.0779***	0.0746***	0.0845***	0.629***	-0.227	0.0489**
	(0.0169)	(0.0219)	(0.0285)	(0.133)	(0.148)	(0.0249)
σ_H	-0.00896	-0.0729	0.0790	0.178	0.345	0.0764
	(0.0484)	(0.0750)	(0.0717)	(0.419)	(0.372)	(0.0692)
σ_{NH}	-0.149	-0.107	-0.175	-0.625	0.000665	0.0212
	(0.180)	(0.220)	(0.347)	(1.372)	(1.523)	(0.293)
HHsize	-0.0278	-0.0641**	0.0107	0.512**	0.182	-0.00471
	(0.0217)	(0.0254)	(0.0318)	(0.201)	(0.150)	(0.0371)
Sickness	-0.0268	-0.0937	-0.0529	-0.266	0.944**	-0.107
	(0.0450)	(0.0589)	(0.0733)	(0.378)	(0.428)	(0.0779)
Debt	-0.553***	-0.250	-0.968***	-1.581	-3.442***	-0.966***
	(0.161)	(0.179)	(0.282)	(1.566)	(1.173)	(0.309)
Constant	7.255***	7.496***	5.063**	1.819	-6.540	3.827**
	(1.170)	(1.685)	(2.149)	(8.022)	(9.697)	(1.614)
Observations	1135	1135	1135	1135	1135	1135
R-squared	0.134	0.122	0.098	0.087	0.037	0.076
Number of HHs	506	506	506	506	506	506

Bootstrapped standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 1.7 Asset Shares 3SLS Regression

VARIABLES	3SLS		IV Fixed Effect	
	w_H	w_{NH}	w_H	w_{NH}
Lagged w_H	0.288***			
	(0.068)			
w_{NH}	-0.280***		-0.336***	
	(0.068)		(0.0897)	
α_H^+	0.003	0.037	0.0205	0.0636**
	(0.011)	(0.024)	(0.0218)	(0.0260)
a_H^-	-0.008	0.016	0.0221	0.0598**
	(0.013)	(0.020)	(0.0280)	(0.0292)
α_{NH}	0.086***	-0.074	0.0786**	0.0640
	(0.018)	(0.052)	(0.0384)	(0.0459)
R	-0.004	-0.020	-0.0193	-0.0662**
	(0.012)	(0.029)	(0.0210)	(0.0324)
σ_H	0.001	-0.020	0.00583	-0.0711
	(0.024)	(0.031)	(0.0470)	(0.0725)
σ_{NH}	-0.106	0.511***	0.308	0.774**
	(0.114)	(0.184)	(0.226)	(0.335)
HHsize	0.016**	0.001	-0.00165	-0.0337
	(0.006)	(0.011)	(0.0283)	(0.0328)
Age	-0.047***	0.051**		
	(0.013)	(0.025)		
Age^2	0.000***	-0.001**		
	(0.000)	(0.000)		
Schooling	-0.012	0.199***		
	(0.043)	(0.050)		
Female	0.058	-0.086		
	(0.055)	(0.109)		
Largest Province	-0.005	-0.015		
	(0.052)	(0.069)		
Lagged w_{NH}		0.337***		
		(0.050)		
w_H		-0.148		-0.852***
		(0.205)		(0.329)
Constant	0.620	-4.189***	-2.838*	-4.411*
	(0.981)	(1.384)	(1.455)	(2.278)
Observations	1135	1135	1,135	1,135
R-squared	0.437	0.352	506	506

Notes: (a) Bootstrapped standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. (b) w_H= share of housing assets, w_{NH}= share of non-housing assets. (c) Stock Yogo critical value: 10%, 15%, 20% and 25% maximal IV size values are 16.38, 8.96, 6.66 and 5.53 respectively. Sargan test: equation is exactly identified.

Table 1.8 Responsiveness (% changes)

		10% Positive change							
% change	Model	α_H^+	α_H^-	σ_H	α_{NH}	σ_{NH}	R	*%H*	*%NH*
Total Expenditure	Fixed effect	-0.49	0	0	-1.39	0	0.78		
Food Expenditure	Fixed effect	0	0	0	-1.94	0	0.75		
Non Food Expenditure	Fixed effect	-0.73	-0.59	0	-0.82	0	0.85		
Education Expenditure	Fixed effect	0	0	0	-12.96	0	6.29		
Medical Care Expenditure	Fixed effect	0	0	0	4.48	0	0		
Other Non Food Expenditure	Fixed effect	-0.82	-0.63	0	0	0	0.49		
Share of Housing Asset	System 3SLS	0	0	0	0.86	0	0	-	-2.80
Share of Non-Housing Asset	System 3SLS	0	0	0	0	5.11	0	0	-
Share of Housing Asset	IV fixed effect	0	0	0	0.79	0	0	-	-3.36
Share of Non-Housing Asset	IV fixed effect	0.64	0.60	0	0	7.74	-0.66	-8.52	-
		One Std. deviation							
% change		α_H^+	α_H^-	σ_H	α_{NH}	σ_{NH}	R	*%H*	*%NH*
Total Expenditure	Fixed effect	-25.45	0.00	0	-1.81	0	0.25		
Food Expenditure	Fixed effect	0	0.00	0	-2.52	0	0.24		
Non Food Expenditure	Fixed effect	-37.91	-42.13	0	-1.07	0	0.27		
Education Expenditure	Fixed effect	0	0	0	-16.86	0	1.99		
Medical Care Expenditure	Fixed effect	0	0	0	5.83	0	0		
Other Non Food Expenditure	Fixed effect	-42.58	-44.98	0	0	0	0.15		
Share of Housing Asset	System 3SLS	0	0	0	1.12	0	0	-	-0.07
Share of Non-Housing Asset	System 3SLS	0	0	0	0	12.74	0	0	-
Share of Housing Asset	IV fixed effect	0	0	0	1.03	0	0	-	-0.08
Share of Non-Housing Asset	IV fixed effect	33.23	42.84	0	0	19.30	-0.21	-0.22	-

*Note: (a) N=1135, (b) Std. deviation is in 10,000 IDR.

Appendix

Table A1.1 Estimates by Expenditure Quartiles

	Expenditure Quartiles				
	1st	2nd	3rd	4th	Model
Total consumption expenditure					Fixed effect
α_H^+	0.0134	0.00508	-0.0191	-0.0071	
a_H^-	-0.00959	0.00441	-0.0363	0.00323	
σ_H	0.0615	-0.0616	0.0426	-0.0286	
Food					Fixed effect
α_H^+	0.0344	-0.0155	0.0173	-0.0647	
a_H^-	0.00569	-0.0072	0.00916	0.0219	
σ_H	0.0995	-0.184	0.02	0.0389	
Non-food					Fixed effect
α_H^+	-0.0159	0.0228	-0.116	0.0418	
a_H^-	-0.0106	0.0211	-0.174	-0.0154	
σ_H	0.048	0.173	0.153	0.00943	
Education					Fixed effect
α_H^+	-0.111	0.00319	0.589	-1.562***	
a_H^-	0.0582	-0.287	-0.574	-1.037**	
σ_H	0.529	1.3	-2.499	2.384	
Medical					Fixed effect
α_H^+	-0.193	-0.441	0.161	0.381	
a_H^-	-0.0612	-0.516	0.42	-0.14	
σ_H	-0.456	-0.496	0.551	-0.21	
Other non-food					Fixed effect
α_H^+	-0.00594	0.0398	-0.196***	0.018	
a_H^-	-0.0142	0.0482	-0.179	0.0339	
σ_H	0.0587	0.108	0.18	0.0306	
Share of housing assets					System 3SLS
α_H^+	-0.002	0.034	-0.040	0.008	
a_H^-	-0.006	0.012	-0.067**	-0.010	
σ_H	-0.074**	0.049	0.013	0.042	
Share of housing assets					IV fixed effect
α_H^+	0.0169	0.0710	-0.0280	-0.00328	
a_H^-	0.0166	0.0359	-0.0786**	-0.0256	
σ_H	-0.0805**	0.0262	-0.0135	0.0558	

CHAPTER II

SOCIAL VALUES AND INTERNATIONAL TRADE: THE INTERPLAY BETWEEN SOCIAL VALUES AND FORMAL FINANCE

Abstract

In a wide variety of studies, social trust has been shown to have significant effects on economic growth and development by improving the scope and efficiency of non-market transactions. Trust can create alternative sources of finance to firms when formal finance is scarce or entails large transaction costs (as is typically true in economies with less developed financial systems). As an important component of GDP, exports can also be expected to benefit from trust. Exporting firms not only confront higher transaction costs (mainly owing to their nature of markets) but can also face tighter financial constraints compared to firms focusing exclusively on the domestic market. Exporting involves several upfront costs for which liquidity constraint can become a serious impediment as shown in Manova (2008a).

With this background, we examine the effect of trust in two dimensions: trust in people in general and trust in family and friends. We hypothesize that high levels of trust

in an economy with relatively less developed formal sources of finance can have positive effect on exports as informal institutions can offer alternative sources of finance. Using the World Values Survey (WVS) and the UN Comtrade data for the period 1994-2007, we find that in countries with lower level of financial development, trust has a positive and significant effect on the value of exports. The analysis at two and three digit level not only allows us to control for industry level heterogeneity but also mitigates concerns of endogeneity. This is because with two and three digit industry level trade values, financial market attributes may be viewed as exogenous which are set at economy wide level.

I. Introduction

Social values underlie important elements of a wide range of social resources, such as network, relationship among people, social ties and connections and social activities among others. Social values, in general, not only exist in our daily life but also can exert have significant effect on economic activities and outcomes. In this paper we focus on two prominent aspects of social values: trust in people and attitude towards friends and family (in particular, how important people believe family and friends are), hitherto referred as 'trust in people' and trust in 'family and friends'. .

Trust can affect economic activities through several channels. Trust reflects people's general judgment and evaluation on others as well as country's social environment. Trust in family and friends reflect, among other things, strength of close-knit social networks. Trust plays a role in many aspects of economic behaviors and often works as one of basic ingredients underlying an economic decision. In this research, we examine the role of trust in international trade, and try to estimate the underlying financial impact of trust on trade flows.

In recent times, the role of trust in economic performance has attracted a great deal of attention. A number of studies find trust to be positively correlated with economic performance. Boulila, Bousrih and Mohamed (2008) find that, apart from a positive correlation between trust and growth, trust has an indirect effect on economic activities through institutional development. Knack and Keefer (1997) argue that economic performance is highly correlated with trust and civic cooperation. Josten (2004) find that for long-run economic success, trust and mutual cooperation are important factors.

The role of trust has been examined in many empirical works, most notably in economic development. Higher level of trust reduces friction among participants, saves time and capital on collecting information and doing business. As Knack and Keefer (1997) suggest, higher-trust societies have lower transaction cost, and trading agents do not have to invest more resources to protect themselves from unexpected losses, because they can rely on the protection from trustable formal and informal institutions. Meanwhile, firms could reallocate resources to other aspects such as innovation instead of trade protection and meeting their transaction cost requirements.

Trust, by lowering transaction costs, can also improve economic performance by providing more channels to access working capital. Intuitively, such financial effects can be assumed to be more important for countries with lower level of financial development where the formal institutions are not well developed to meet the credit needs. Trust can, to varying extent, fill in for limitations in the formal sector and institutions and be an important source of informal credit.

Until now, most of the studies focus on the effect of trust on economic development. Globally as markets are becoming more integrated, production and consumption levels in the domestic market are not sufficient to reflect a country's economic status and size. Exports grew to be as much as 20% of the world's GDP in 1999 and this share has been rising. As openness of developing countries in particular has increased over time, the financial needs of the exporting sector have risen alongside.

Trust (within the exporting country) can be important for trade through several channels. First, with higher levels of trust, it is less expensive to achieve desired

information, and process transaction or business activities. There is also the social network aspect of trust, especially in family and friends.

There are several factors (owing to moral hazard, adverse selection, etc.) where trust among trading partners could play important roles. Given the strong role of asymmetric information, the role of social networks spanning the trading partners has been widely studied following the pioneering work by Rauch (1999). Other works along these lines include Epstein and Gang (2004) and Rauch (2001).

In Rauch (2001) the role of social networks (defined by ethnic ties across borders) is shown to mitigate some informal trade barriers that are ubiquitous in international trade flows such as problems of enforcement of international contracts, availability of sufficient information, etc. Rauch (2002) finds that because of the large and widespread population of overseas Chinese, ethnic Chinese networks have a significant effects on bilateral trades.

It is reasonable to assume that the establishment of ethnic networks is highly correlated with trust among people who share the same language, cultural background, and nationality. Epstein and Gang (2004) provide detailed discussion about ethnic networks and international trade. Migrants have advantages in doing international trade, because they try to be assimilated in the host country natives, as well as keep in touch with home country. Both the host and home country networks play an important role in bilateral trades.

Our focus in this research is trust within an exporting country and its impact on its trade. The trust measures used in this analysis, arguably, reflects people's general judgment and evaluation on others as well as country's social environment as well as the

strength of close-knit social networks. There could be several pathways through which trust in an exporting country could play a role in international trade. While we do not want to rule out the possibility that several correlated channels could be at work such as insurance the degree of which could vary positively with trust, our identification strategy focuses on one of the important channels, the credit channel.

Little research exists on the association between trust in a country and international trade. Some of the work that does exist looks at the causality from trade to trust rather than the converse. Thus papers such as Rodrik (1997) argue that trade openness may lower the trust of a society and lead to social "disintegration". By using the volume of trade as a measure of market openness, Chan (2007) empirically rejects this hypothesis, and shows that the trade openness does not hurt trust level; it actually enhances social values (trust) and strengthens the power of informal institutions.

To the best of our knowledge, the issue of the effect of trust (within a country) on trade has not been studied. This paper aims wants to contribute to the literature by estimating the effect of the state of trust within an exporting country on the level of exports. In light of the studies mentioned above that discuss the effect of trade on trust, we are aware of the potential feedback effects. By doing the analysis of bilateral (as opposed to aggregate trade) at the disaggregated two and three digit industry level, we mitigate the concern of endogeneity. It is unlikely that the trade flow of an individual industry disaggregated at the two-digit or three-digit levels with specific country can exert a significant effect on the trust levels in the entire economy. We, therefore, disaggregate the data at the industry level and look at effects on trade at country pair level to lessen the concerns of reverse causality.

Our focus on credit market links is motivated by findings in studies such as Manova (2010). Amiti and Weisnstein (2009) argue that because of the credit default risks and time lags during the process of international trade, exporters require more financial support from banks, especially trade credits, than other producers. Generally, the average period of completing an international trade contract is extended due to reasons such as distance, different requirements of documents in exporting and importing countries, etc. Long trading time decreases the efficiency of capital flow and increases the risk of claiming initial investment. Meanwhile, unfamiliarity with foreign markets increases the default risk. If trading partner refuses to execute contracts it is more difficult, compared to the domestic market, to recover through collaterals or enforce punishment.

High capital demand and high riskiness in contract make the price of credit expensive for firms trading across border. Exporters or importers may have to pay higher capital price in order to receive their desired amount of credits. This price in principle could vary depending upon the identity of the trading partner.

Manova (2008b) shows that financial constraints are an important factor determining international trade flows in a setting of Melitz (2003) where there are fixed costs of exporting and there is firm hetergeneity. Using firm-level evidence, Manova, Wei and Zhang (2009) confirm the results that, it is not only trade volumes (the intensive margin) but also the trading destinations (the extensive margin) that are restricted by credit constraints; whereas foreign owned or jointly owned firms can export more because they have wider access to capital resources. This linkage invokes an alternative channel because of which financial constraints could vary across trading partners.

Overall, the findings are that with higher levels of financial development trade flows increase (Manova 2008a, Berthou 2007).

This paper corroborates the findings in Manova (2008a) and Berthou (2007) to the extent that finance matters for trade but the focus here is on substitution between formal and informal sources of finance where the latter is assumed to be more dependent on social trust. Knack and Keefer (1997) argue that poorer countries in particular could benefit more from higher trust level in that they do not possess well-developed financial system and reliable legal institution as many developed countries do. We take this line of reasoning and put to test in the context of international trade.

We use panel data from 78 countries ranging for the period 1994 to 2007. The trust measures come from the three waves of the World Value Surveys (WVS). The trade information comes from the UN Comtrade data. The information on formal finance comes from World Development Indicators (WDI).

We use a modified gravity model to estimate the cross-country and cross-sector effect of trust on international exports. The effect of trust is assumed to be less important in countries with developed sources of formal credit. Conversely, firms in countries with less inadequate sources of formal credit would likely make use of informal sources which relies on trust and would therefor affect trade. Therefore, we will adopt an empirical specification that invokes this identification channel for the role of trust in covering for lack of formal credit. Note that the availability of formal credit is measured by the domestic credit provided by banking sector as a percentage of GDP, a measure used by a number of previous studies (Manova 2008a; Berthou, 2007; Rajan and Zingales, 1998).

In addition to country-pair specific information, we also introduce exporter, importer and time fixed effects in our estimation to capture the role of unobservable fixed factors. Exporter and importer fixed effects are included to account for multilateral resistance following Anderson and vanWincoop (2003) who suggest their importance in a proper specification of the gravity model. Feenstra (2004) shows that coefficients in a gravity model can be consistently estimated if importer and exporter fixed effects are used to capture the effect of the multilateral resistance terms.

Furthermore, we conduct the analysis at the disaggregated two and three digit level of ISIC (Revision 3) product code list from UN Comtrade database. Considering the unique characteristics of each type of product, this level of analysis allows us to control for industry level unobserved factors.

As a robustness check we repeat the analysis on a subsample that excludes China. This is because China is a very large trading country with a mixed economy in terms of formal and informal sectors. China accounted for as much as 10% of the world's export value in 2009. Both the product varieties and destinations for China are relatively large in each wave compared to the other exporters. By removing it from the original dataset, we can test if our hypothesis is still generalized across all other countries without the intensive power of China.

The paper is structured as follows: Section II reviews the previous studies about trust, especially trust and economic growth, trade, financial development level and other related issues. Section III introduces the data we use for the estimation. Section IV presents the model and regression results. Section V concludes.

II. Literature Reviews

A number of studies have examined the relationship between trust and economic growth. Broadly, the consensus is that advanced social relationships positively affect economic growth. Josten (2004), Chou (2005), Boulila, Bousrih and Trabelsi (2008), and Castano (2007) all present empirical evidence of the existence of positive effect of trust on economic growth. Nonetheless, the extents of such effects, i.e. the estimated magnitudes, vary across studies.[11]

Knack and Keefer (1997) pioneered the research on the effect of higher trust level and civic norms on enhancing economic growth. In a society in which people trust each other, individuals spend less time and resources in business transactions, especially in the trust-sensitive businesses; with higher trust, people do not need to incur extra costs to protect themselves since they are in a relatively safe environment. With capital saved from self-protection and transaction, they can put it into investment activities that eventually increase economic growth. Their empirical results not only show the significant effect of trust on aggregate economic activity, but also provide evidence that poorer countries in particular could benefit more from higher trust level in that they do not possess well-developed financial system and reliable legal institution as many developed countries do.

[11] Trust has long been recognized as a critical dimension of "social capital" that is formed by authority, trust, norms (Coleman, 1990, pp300-301), and social networks (Knack and Keefer, 1997). As one of fundamental resources of production input (Knack and Keefer, 1997), social capital interacts with both physical and human capital and thus enhances the benefits of those two capital investments (Knack and Keefer, 1997). Through this channel, the effect of trust on economic growth and development is conceptualized. However, social capital being an ill defined concept, we believe that the concept of trust is more precise and the use of trust alone in our analysis much more meaningful.

Zak and Knack (2001) agree with the idea that high trust could reduce the cost of investigating brokers, and also examine the influence of trust on investment rate and income growth rate. In the model, trust is explained as the time taken to complete the production activity. In Zak and Knack (2001) trust is determined by "social economic and institutional environments". For example, societies with more equal income exhibit higher trust; homogeneous societies have higher levels of trust; whereas trust level decreases as discrimination rises. The prediction is that if trust grows up in these circumstances, growth and investment rate will increase simultaneously. The empirical results generally support the hypothesis. For instance, investment/GDP share shifts up by 1% with a 7% increase in trust.

Subsequently, while several studies have extended the research in the two papers discussed above along different dimensions, Beugelsdijk, Groot and Schaik (2004) improve upon the data limitations in Knack and Keefer (1997) and Zak and Knack (2001) and perform robustness checks of the relationship between trust and growth. By using new econometric methods, adding additional controls for the omitted variables in the two papers, and extending the size of the dataset, they reveal that in most dimensions, the results are robust. Furthermore, Berggren, Elinder and Jordahl (2008) continue this study and work on the case excluding outliers. They claim that even though the robustness of trust-growth relationship is strong in previous studies, without some outliers, such as China and Ireland, both the coefficient and effective size of trust is much smaller. Removing China from the sample, the estimated effect of trust is nearly half the original figure. It alerts us that the outliers may change the estimation significantly. We draw upon this result and perform the robustness check with the exclusion of China which, in

analysis of trust and trade through the pathway of substitution between formal and informal institutions, could be disproportionately important.

Dearmon and Grier (2009) summarize four ways to examine how trust fosters economic development. First of all, it could directly have an impact on growth; secondly, trust reduces the transaction costs and increases profits correspondingly; thirdly, trust raises the rate of physical capital accumulation; finally, human capital becomes more efficient with the interaction of trust. In their cross-sectional study, they use GDP per capita as an indicator of growth, and find a direct positive effect of trust, as well as indirect effects which improve the human capital's performance on growth. For example, GDP per capita will increase by 2.4% if the trust level changes one standard deviation upward.

As discussed above, international trade accounts for almost 25% of the world GDP in recent years. It should thus be natural to ask if trust affects trade. Though there do not exist studies examining the effect of "trust" on trade, effect of social networks on trade have been investigated. These studies often focus on measures of bilateral networks across trading partners. In contrast, this paper focuses on societal trust in the exporting country and its effect on aggregate exports as well as bilateral trade flows.

Intuitively, stronger social networks can be facilitated if people trust each other. A trusting environment is conducive to stronger and more effective social networks. An appreciation and positive attitude toward family and friends is yet another aspect of social values that alludes to stronger social networks.

Rauch (2001) investigates the role of social networks in international trade in detail. Usually there exist some informal trade barriers blocking bilateral trade flows, for

instance, problem of enforcement in international contracts, lack of information, etc. Social networks and transnational business help lower the barriers and increase international trade from several aspects. When facing enforcement problem in contracts, social networks will degrade the credit, or trust level of trading partners. Social network can also transfer the information about agents' characteristics, and increase the opportunities for both sellers and buyers to find matched partners. As intermediaries, social networks help those agents who cannot access the trade market directly, transfer the information in two directions, and eventually make international trade more efficient as well. In this situation, goods and services can be allocated in a wider range instead of limited members. These requirements such as information vary across product characteristics and Rauch introduces the concept of homogeneous and differentiated products to identify the effects of networks where the latter embodies a greater role for networks.

Rauch (1999) separates the products into homogenous and differentiated commodities. The former receives weaker returns from networks because they have fewer varieties, and do not necessarily need the agents to match special buyers' requirement costly in foreign market as the latter one do. Rauch (2002) applies this model to the case in China. Because of the large and widespread population of overseas Chinese, ethnic Chinese networks display significant effects on bilateral trades.

It is reasonable to assume that the establishment of ethnic networks is highly correlated with trust among people who share the same language, cultural background, and nationality. Epstein and Gang (2004) provide detailed discussion about ethnic networks and international trade. Migrants have advantages in international trade because

they try to be assimilated in the host country as well as keep in touch with home country. Both the host and home country networks play an important role in bilateral trades.

International trade can be benefited from trust which decreases the trading costs on both sides. This finding is widely accepted and can explain some of the "mystery of missing trade". Explanations of missing trade go beyond distance, or tariffs, and goes into the territory of social values such as lack of trust between two countries (den Butter and Mosch, 2003). In their research, trust is divided into two classes: formal and informal trust. Formal trust is represented by "formal agreements and formal procedures". Legal institutions offer the protection for traders. Informal trust is "based on intrinsic motivations". Societal trust and people's attitudes to others are some of the basic forms of informal institutions. Both types of trust show substantial effects on bilateral trade, and their combined effects can lead the positive change of bilateral trade volumes from 90% to 150% increase in bilateral trade volumes.

Cultural differences also affect bilateral trade through the channel of bilateral trust. Analyzing data in European countries, Guiso, Sapienza and Zingales (2009) demonstrate that trust toward partner country can be affected by cultural roots, and in turn change the bilateral trade with greater extent than predicted by standard gravity models.

Note that the papers cited above deal with networks or trust measures across trading pair. In contrast, we look at intra country measures of trust and its effect on level of exports using the differences in level of financial development as the basis for identification of the effects. In essence, we capture the effect of trust by delineating one

of the channels through which it could be operating i.e. by improving access to credit under prior constraints.

One final strand of literature that we need to refer to vis-à-vis the research in this paper relates to the issue of reverse causality from trade to trust. The increased openness of market may lead to social disintegration (Rodrik, 1997). Chan (2007) tests this claim, and empirically tests that openness does not reduce the level of trust in most of societies. He uses trade volume as proxy for openness and level of globalization, and finds that generalized trust actually improves by globalization. In a society with more equalized income, openness leads to the decline of quaint, old values and the acceptance of new, useful values from foreign countries, so people are more collective in such environment, and generalized trust should be higher. The issue of reverse causality in our case even if it were true is mitigated to some extent because of the disaggregated product level analysis.

These papers generally reflect the direct relationship between trust or social networks, and international trade by either lowering informal trade barriers and transaction costs, or trust's straightforward effects. Focusing on the financial market channel for trust, it is important to first outline the relationship between financial constraints and international trade.

Why do financial factors matter for international trade market? Stiebale (2011) provides two reasons for this: first, a developed financial system allows exporters to get sufficient funds that can give them a comparative advantage; secondly, trade cost limits firms' ability to participate in international market as there are more fixed costs involved in exporting. Melitz (2003) proposes that firms which want to enter export market face fixed sunk cost, and only those with productivity above the cut-off (a threshold) are able

to export successfully. Based on that, Manova (2008b) introduces financial constraints into directly Melitz's model, and counts the relative cost of getting credits as part of export costs which in turn determines firm's ability to enter export markets. Firms overcoming both financial and other sunk cost become eligible to be exporters.

Manova, Wei and Zhang (2009) compare foreign-owned firms and joint ventures, and find that the former perform better in export market since they can receive financial support from their parent firms and experience more flexible financial constraints than the latter.

Financial constraints comprise not only capital restrictions, but also firm's financial health, in terms of indicators such as liquidity and leverage. With better financial health, it is easier for firms to cover the entry cost and ease their financial constraints. In Greenaway, Guariglia and Kneller (2007), exporters, especially continuous and consistent exporters, tend to display better financial health than non-exporters. Since firms will be screened off from export markets if they do not have adequate financial strength, those successfully selling products abroad possess financial advantage (Bellone, Musso, Nesta and Schiavo, 2010); they also find that increasing number of exporting destinations leads to higher sunk costs of entry and can harms firm's financial health.

To summarize, the level of development of financial markets is one of the important determinants of trade flows. Level of financial development on the one hand increases economic growth as discussed above (which itself increases trade over time), on the other hand it lets firms raises funds at a lower cost (Rajan and Zingales, 1998). Manova (2008b) proposes that both financial development as well as financial vulnerability determine financial constraints and affect the volume of exports as well as

the extensive margin in terms of the number of varieties and turnover in product composition. Berthou (2007) finds similar effects of financial development on trade.

With this background we test if trust can be an important factor in determining exports by filling in for formal sources of finance if they are lacking or are underdeveloped.

Some studies consider the relationship between trust and institutions where formal institutions facilitate economic activities with laws or other official rules, and informal institutions that run on social values. It is in case of the latter that trust is more important since it is likely to be correlated with the development of informal institutions. Knack and Keefer (1997) conclude that in areas with weaker formal institutions, trust is more important to economic growth. Trust reduces the coefficients of variables that proxy for formal institutions in Zak and Knack (2001); they explore the role of trust on investment as a percentage of GDP and growth rate of GDP per capita through the pathway of interaction between informality of the institutions (related to credit) and the consequent need for trust.

III. Data

The trust indicators we use are from the World Values Survey (WVS), where five waves have been conducted so far. The first survey was carried out in 1981. We use the last three waves where the trust measures are available. In the World Values Survey, the third wave is from 1994 to 1998, the fourth is from 1999 to 2004, and the last one is from 2005 to 2007. The number of countries covered in the three waves is 52, 67, and 54, respectively. Over 248,000 people were interviewed, and they represent nearly 88% of

the world's population as of 2007 (WVS Association). The WVS provides detailed information about human capital, religion, politics, economic and social lives in countries over time (WVS Association).

In the WVS, there are many related questions on people's attitude and relationship with others, and also on their social behavior. For instance, people were asked about how they value their relationship with their family members and friends, their colleagues; how they involve themselves in social activities; and how they evaluate the social environment around them. Furthermore, there are several questions involving trust. For example, people were asked how they trust their neighbors, people they personally know, people who they first meet, and people from other nations/religions. Considering the consistency of the phrasings of the questions and availability for a reasonably large number of countries, we choose the question about "trust in other people", and people's attitude to family and friends as proxies for the two trust measures.

The question for the first trust variable is put as follows "Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?" The options for answer are as follows: "most people can be trusted" coded as 1 or "cannot be too careful" coded as 2. For estimation purposes, we convert the responses into a binary measure where 1 stands for "trusted", and 0 otherwise.

With the data collected from a nationally representative sample, we consider the average value as the country's trust level which reveals the percentage of people who would like to trust others. Knack and Keefer (1997) distinguish "other people" in this variable from the definition including family and friends. We could then assume that in a

high-trust environment, it is easier to believe in others whom one meets infrequently or irregularly.

Generally it is family and friends that are closest in relationship for most people. Since "trust in other people" excludes family and friends, it is necessary to examine the potential effects from this group of people separately. We choose questions which capture people's attitude towards their family and friends. In the WVS, respondents were asked to mark the importance of family and friends in their lives on a graded scale. The ptions for this question were: 1 for "very important", 2 for "rather important", 3 for "not very important" and 4 for "not important at all".

We convert the categorical variable into dummy variable that equal 1 if people think family or friends as "very important" to them. We believe that this best measures trust in that people seriously consider the status of their family and friends in their life, have tight connection with them, and treat them as trustful. We rename this variable trust in family and friends which is equal to 1 if people choose both family and friends are "very important" in their life, zero otherwise. Note that constructed in this way, we treat the effect of importance of family and friends equally. Similar to the "trust in people", this trust variable shows the percentage of people who trust their family and friends in a country.

Therefore people's attitude towards family and friends directly reflects how much they believe in them. In other words, the trust level could be assumed to be positively correlated with the importance put on family and friends. Note that the part of importance of family and friends could lie in the possibility that they can be called upon to provide funds when needed.

In our dataset for estimation, there are 35, 22 and 30 countries appearing as exporter in each wave. Table 2.1 summarizes the two trust variables by waves. On average, more than one quarter of people in exporting countries believe that others can be trusted. The minimum value of trust is in Brazil over the period of 1994-1999 at less than 3%. The maximum value is from Sweden in the last wave, and nearly 68% of interviewees are likely to trust others. Small within group standard deviation reflects that people's evaluation on trust is relatively stable over time; in fact, within variation is less than one fifth of the total variation.

For the family and friends variable, globally nearly 40% people think that their family members and friends are very important. The average value of importance of family and friends is significantly higher than the trust in other people. It is expected that trust/importance is higher in case of closer connections. The lowest value is from the third wave in Bangladesh, and the highest value is from the last wave in Georgia where over 78% population classifies their family and friends as very important. Again the values are very stable over time where the within variation is only one fourth the total variation.

Trade data comes from UN Comtrade provided by the United Nations Statistics Division (UNSD). It contains the largest bilateral international commodity trade information over 140 countries and regions since 1960.

Figure 2.1 describes the trend of exports of goods and services as a percentage of GDP for the whole world from 1994 to 2009, respectively. The world's total export comprises more than 20% of GDP since 1999, and up to a quarter after 2004, though there is a sharp drop in 2009 due to the financial crisis. Not only has volume of exports

risen over time but number of trading nations has also gone up. In 1994, only 99 countries exported some goods or services, and 62 of them were developing countries; the number of importing countries was 226. In 2003, 166 countries exported, and 119 of them were developing countries. Figure 2.2 shows the change in the number of trading partners. As openness of developing countries has increased over time, the financial needs of the exporting sector are expected to have risen alongside.

Since financially developed countries usually have more exports and diverse destinations (Manova, 2008b), and both of the trust and financial variables in this research are at the country level, then aggregate level of exports could face problems of endogeneity. In our research, we use the data with the ISIC Revision3 classification using the export flows data at the two and three digit sector level. There are 31 types of products at two digit level while the three digit level includes 72 industry/sectors. For example, 01 is labeled as "agriculture, hunting and related service activities" at the 2 digit level and includes 2 subcategories at the three digit level: 011-- "growing of crops; market gardening; horticulture", and 012—"farming of animals". In our analysis, for a single observation, the trade value is the quantity of a specific type of product shipped from country *i* to country *j*. In total there are 51 exporting countries, and 132 importing countries spreading into 3 waves, and the total number of country-pairs adds up to 4750.

The WVS was conducted by 3-5 year waves. We create the mean value of trade volumes for each wave. All trade values are deflated and measured in constant US dollars (Year 2000=100) in order to remove the inflation effects. However, since only a part of countries join the survey every time, the whole panel is unbalanced.

Following Manova, (2008a), Bertho (2007), Rajan and Zingales (1998), one of the proxies for financial development is the domestic credit provided by banking sector as a percentage of GDP coming from the World Bank's World Development Indicators (WDI). For most markets, banks are the major source of credits. Banks' capacity for providing funds to support economic activities reflects the level of development of country's financial market.

In addition, the financial development variable is converted into dummy variables by the following method. First we take the average value of these variables by WVS wave. We calculate the median values of all countries available in the WDI database in each wave, and use the global median as the dividing line. We create new dummy variable which equals 1 if a country's value is less than the median. A country is labeled as less financial developed if its financial indicator is less than the global median value, otherwise it is considered financially developed.

Table 2.2 presents the statistics of the financial development indicator in both continuous case and by waves. The credit variable assumes a high value in wave 3 due to the extremely high value in Spain.[12] Between 1994 and 1999, based on our measurement of financial development, nearly half of the countries in the WVS belong to the less financially developed group. The share of low financial development countries decreases over time, which is significant since it provides us the variation to capture the interaction between trust and financial development.

Table 2.3a and 2.3b present the summary statistics on trade, i.e., the average value of exports at ISIC 2 and 3 digit levels (revision 3), with and without China respectively.

[12] Spain is, therefore, dropped from the sample in our main analysis. However, the entire analysis has also been carried out including Spain with no qualitative change in the results.

According to the financial development indicator, countries are separated into two groups. Overall, the value of exports increases drastically from 1994 to 2007 in both industry classifications. Note that the average exports are much higher for financially developed countries (credit dummy=0). For example, in two digit classification, the industry average is 20.06 million USD for the developed country group, whereas it is 9.45 million for the other group. Financially developed countries maintain a large share of exports in the world; however, the growth rate of exports of less financially developed countries is higher.

We also set a sub-sample which excludes China in that it accounts for a great proportion of total global exports and still have a high degree of informality in the economy. Tsai (2004) mentions that in China the government limits informal finance to prohibit borrowers from usurious money-lending. Informal money-lending is illegal (according to China's central bank). Using firm level data, Ayyagari, Demirguc-Kunt and Masksimovic (2010) find that though 80% of the sampled firms financed from "reputation and relationship-based" channels, it is not responsible for the fast growth of private sector in China. In wave 3, the share of China's exports is around 9.5%, and grows to 21.4% and 23.6% in wave 4 and 5, respectively. Analysis on a sample without China is one of our robustness checks. Table 2.4a is the description of the trust variables classified by categories of financial development. The average value of trust in other people is much higher for countries in financially developed category. For instance, around 30% of people trust others in countries that are over the global median value of credit disbursement; the corresponding number is only 20% in the converse case. Two groups do not have a significant difference in average value of importance of family and

friends in either indicator of financial development. Over 40% of people rate their family and friends as very important to them. When market capitalization is equal to 1 i.e. less financially developed, in wave 5 nearly half of total people treat their family and friends as very important. The average values of trust variables do not change significantly if China is omitted from the sample (Table 2.4b).

Since our assumption is that as financial development level is a significant factor in determining exports (both propensity as well as levels), and trust can be a compensation for a lower level of financial development, we explore the correlation between the trust variables and export values by country groups. Table 2.5 presents the correlation of trust variables and export values for different financially developed groups. Except the case of trust in family and friends for financially developed countries, all correlations are positive so implying that trust may improve the export volumes for countries with lower level of financial development. Trust in other people has higher correlations with exports than the trust in family and friends. As comparison, in Table 2.5 for more financially developed group though trust in other people is still positively correlated with exports, the value is lower than the less financially developed countries. Trust in family and friends even shows negative correlations. Based on the correlations we can assume that trust values have stronger relationship with exports, especially for less financial developed countries.

Additionally, several country-pair specific variables are included in the different specifications. The uniqueness of country-pair could affect the quantity and possibility of trade. According to their nature, such country-pair variables can be divided into two groups, time-invariant variables such as distance, cultural background etc.; the other set

of variables that are time varying across different waves, such as tariff rate. We include several pair varying control variables such as whether the pair of countries share boundary, whether both countries are landlocked, and whether both countries have coasts. The other set comprises cultural and economic background variables including whether two countries share same language, whether they ever had a colonial relationship, whether they share common legal origin, whether two countries had or have a war between them, whether both countries use common currency and whether they are members of GATT.

We also want to include some additional country-pair specific variables. Among the time varying variables we include: business costs for both exporting and importing countries. Business costs are the amount of money required for firms to start their business in the market. It is calculated as a fixed share of annual GNI per capita so that the value of costs varies in each wave. The barrier for entering the market is high if the business costs are high. Since it would be costlier to meet requirements for entering exporting markets, covering the start-up costs is the basic condition for firms to begin their international business. We take the average value of business costs for a trading pair in each period.

The effect of this variable can be ambiguous. If exporting country has high business costs, it is harder for firms to enter the market, and this also prevents exporting. If it is the importing country that has high business costs, it can stimulate exports to such countries. The last possible case is that both countries have similar cost requirements and it is hard to predict the effect of barrier from start up costs. The second time-variant

variable is the country-pair specific tariff rate which is from UNCTAD and WTO database. Each country-pair typically has a specific tariff in each wave.

IV. Model

To test our hypothesis of trust being important in face of lack of formal finance, we estimate the interaction effects of two key variables. The financial development indicator (formal credit) is a dummy variable that separates the observations into two categories. When it is equal to 1, it represents the lower level of financial development.

To begin with, we follow Manova's (2008a) specification to estimate the effects of trust and financial development on aggregate exports at the industry level. Manova (2008a) uses the aggregate exports at four digit industry level of SITC Revision2 (and aggregated the data to three digit level of ISIC 3 in order to match with financial vulnerability) to examine the effects of equity market liberalization. In her specification, equity market liberalization appears as a single dependent variable as well as an interaction with industry level external financial dependence and asset tangibility. We aggregate the export values by two and three digit industry classifications, respectively. The other difference is that in our main specification trade is country-pair specific in our dataset, and Manova uses aggregate exporter values. To test the trust effects in different financial development categories, we use the credit dummy along with its interaction with the trust variables.

We start with the Manova (2008a) type specification. The estimation equation is:

(1) $$Export_{ist} = \beta_1 FinDev_{it} + \beta_2 Trust_{it} \times FinDevdummy_{it} + \lambda_i + \lambda_s + \lambda_t + \varepsilon_{ist}$$

where the dependent variable is the value of exports from country *i* at time *t* in industry *s*. λ_i is exporter's fixed effects. λ_t denotes time fixed effects while λ_s is fixed effects for the sectors. The *i.i.d.* error term is $\varepsilon_{ijt.}$ *Trust* is represented by two variables: the percentage of people in exporting country *i* at time *t* who trust others, and percentage of people in exporting country *i* at time *t* who think their family and friends are very important. *Fin.Dev* reflecst the level of availability of formal credit in country *i* at time *t*. If it equals 1 then the exporting country has low availability of formal finance (less than median credit disbursement).

The coefficient of the interaction term reflects the differential effects of trust with lower levels of financial development. If it is positive then social trust has a greater effect on exports of countries with less financially developed economies.

Industry dummies fixed effects λ_s in the equation capture different industry specific characteristics. Some industries are more active in export markets compared to others because of several observed and unobserved factors. For instance, in both two and three digit classifications, the export values of mining of uranium and thorium ores are the minimum of all products in the world (possibly because of international regulations as well as their small supplies). On the other side, manufacturing of machinery and equipment has one of the largest export volumes.

Further, we use a set of wave dummy variables λ_t as time fixed effects. Factors such as worldwide economic shocks are subsumed in these fixed effects. If there is any global economic shock attacking the world market, for instance, technology innovation, global economic crisis, etc., it will induce changes in every sector. These kind of changes at the wave level are captured by wave fixed effects.

Note that, having little variation over time, the trust variables are highly collinear with the exporter dummies and hence do not appear in the regression as a separate variable (only appear in the interaction term). Table 2.1 shows the standard deviation for overall sample as well as within groups. Within variation in trust in people (and trust in family and friends) is only 18.75% (26.66%) of the overall variation. This is similar to Manova (2008a) where external financial dependence as well as asset tangibility also does not vary over time.

Except the credit dummy and *i-j* pair dummy variable, all dependent and independent variables are in logarithm.

Apart from the analysis for the aggregate exports, we also consider the effects on bilateral exports. There are several reasons for analysis. First, owing to different reasons, the effects of trust could vary at the level of trading pairs. If lack of information inhibits credit flows then some markets have less knowledge about them among lenders. This could be because of factors like social networks as in Rauch (2001). Even if information were there the markets could differ in degree of risk where outcomes such as contract enforcement are concerned. With multinationals the access to credit for exporters could itself differ. If banks have branches in countries in a trading pair, exporters would have easier access to formal finance.

Finally, the concern for endogeneity i.e. trade having an effect on levels of trust is much less if bilateral exports as opposed to aggregate exports are concerned.

We use the following estimation equation:

$$Export_{ijst} = \beta_1 FinDev_{it} + \beta_2 Trust_{it} \times FinDevdummy_{it} + \beta_3 GDP_i + \beta_4 GDP_j + \beta_5 C_{ij} + \beta_6 D_{ijt} + \lambda_i + \lambda_j + \lambda_s + \lambda_t + \varepsilon_{ijst} \quad (2)$$

where, C_{ij} is a vector of country-pair specific variables which are constant overtime and D_{ijt} is a vector of time-variant country-pair specific variables. In the case, GDP for both exporter and importer are included. As time-variant variables, the economic size of trade partners is basic component in the gravity model. Since trust and financial development variables in the model are exporter specific and trade is bilateral, GDP in *i* and *j* can capture the country's variance over time. Additionally, we add exporting country and importing country dummy variables as fixed country effects, λ_i and λ_j, respectively.

As a vector of time-variant variables for country pair *i* and *j*, D_{ijt} contains two variables. Total tariff rate and average business start-up costs belong to this vector. This vector reflects the trading costs in bilateral trades over time.

The set of country-pair specific variables also include weighted bilateral distance, cultural background variables and other geopolitical characteristics. All country-pair variables are listed in vector C_{ij}.

V. Results

Main Results

Table 2.6a presents the results of specification (1) of industry-aggregate exports (both two and three digits). We do not find significance of the interaction term. The aggregated exports do not provide the variation to estimate the effect of trust and financial development on exports.

Table 2.6b presents the results of specification (2) of bilateral trade in two digit classification with and without China. Table 2.6c presents the same regressions in three digit classifications.

In the full sample (with China, that is), the financial development variable exhibits significantly positive coefficients in both two and three digit classifications except one regression. The amount of exports will increase if banks or other formal financial institutions are capable to providing funds to meet the demands of the exporting firms. As Manova (2008b) argues, firms confront more restricted credit constraints because they must cover costlier spending before starting a business in the export market.

Next we want to check whether higher level of trust in other people affect exports in countries with lower financial development level. The coefficients of trust interacted with private credit issued by banks are significantly positive in all specifications. An additional 10% of a country's population trusting other people would raise exports by 0.95% in two digit industries, and 0.88% in three digit industries.

In a community with greater levels of trust in family and friends it may be easier to find informal sources of finance. However, there is not any positive siginicance shown in either two or three digit classifications.

All country-pair specific variables affect export volumes significantly as well. It is easy to interpret the positive signs of contiguity, language, common legal origin, and colonial relationship. For any pair of countries sharing connected border, it is more convenient for firms and individuals to do the business across the border, and shipping costs can be reduced as well as transaction time. With the same language and common legal origin, people share similar background and the communication barrier will decrease. A pair of countries can build up stronger economic connection if they ever had a colonial tie.

Although common currency is expected to accelerate exports, it does not show the desired effects. Exports lower between country pairs if there are conflicts between them, greater bilateral distance between them, and a higher level of tariff rate between them. If both the trading partners are GATT members then trade increase (GATT's basic goal is to integrate the global market and help promote international trade). Landlocked and coasts are two geographic variables which describe both countries natural characteristics. Exporting activity requires convenient and less expensive method to ship products abroad, and ocean shipping is still the main method to transport products. Exports between two countries with coasts are greater than the trading pair that is landlocked. The effects of business costs are ambiguous to interpret. The increase of exporter's or importer's GDP will contribute to the exports as well.

Overall, the estimation results support our hypothesis that high level of trust can help increase export volumes. Insufficient credits from formal institutions lower exports. Trust in other people can compensates for a lack of available formal credit.

Robustness Check

We remove China from the previous dataset to do the robustness check. Berggren, Elinder, and Jordahl (2008) use a similar approach and find that the trust effects are smaller without China. In our sample, China's total export volumes have taken up to 9.44%, 21.20% and 23.74% of the total sample value in three waves, respectively, and its export destinations cover all importing countries in the dataset. Therefore China has significant impact on the world's export business. To exclude China from the original dataset, we can reduce the weight of a single reporter and check if the trust effects still

exist in the rest of countries. The trust effects in the sample without China is larger than the previous one

The last two columns of Table 2.6a and 2.6b are the regressions using two specifications of trust in two and three digit industry classifications. The significance of formal credits disappears in only one estimation when China is excluded. However, the interactive terms are still significantly positive and have even larger coefficients compared with the full sample's results. Though people in China have high trust level in their families (nearly 72%), they do not give much credit to friends. Only 26% of the population takes the relationship with friends seriously. The low values in trust in friends cut down the value of trust in family and friends. 23% of the population is positive to their family and friends compared with the sample average at 42%. Meanwhile, in China the government does not encourage the informal credits (Tsai, 2004). The full dataset with China represses the effects of trust in family and friends. Excluding China increases the significance of it drastically. When countries are in the category of lower financial development, the marginal effects of trust in family and friends are up to 1.11% and 0.84% in two and three digit bilateral trade respectively with respect to 10% increase of trust value. The trust in other people also raises the corresponding effects which are 1.32% and1.25%.

VI. Conclusion

Previous studies have provided evidence of how trust has important effects on economic performance. In this paper we explore whether trust could have an effect on a country's export performance. The particular channel that we identify is the access to

informal credits, the benefit of which would be magnified if formal sources are inadequate.

We combine the trust data, financial development data, and country-pair export values in two digit and three digit product classifications over a fourteen year period. Variation in aggregate exports is not capable of identifying the effect of trust which has little time variation. We, therefore, exploit the variation in bilateral trade to identify the effect of trust which does not have sufficient time variation. We use an extensive set of country-pair specific factors. The fixed effects from exporting and importing countries, industry, and time are also included in our analysis. Two types of trust are chosen from the WVS: trust in other people, trust in family and friends. Credits issued by banks as percentage of GDP is used as the measure of availability of formal credit. Our empirical specification is rich in extensively accounting for observed and unobserved factors that could bias the coefficients of interest.

In bilateral trade, for financially repressed economies, trust has a significant effect on exports. The amount of credit issued directly determines the level of bilateral trades in dataset with China (the full sample). A great deal of formal credits allows firms to access sufficient working capital to cover the cost to enter the international market. The interactive specification combined with disaggregated level of analyses minimizes the potential biases in the results. Our results also provide evidence that exporters in countries failing to provide sufficient formal credit can rely on informal credit represented by trust.

We believe that trust among people is a new channel for borrowers to collect external credits. This informal channel of financial resources is what can supplement for

less developed formal financial institutions. Trust in family and friends shows significant positive effects when China is removed.

Given the unique situation of China with dualistic economy and very high level of exports, we also check for robustness of our findings by dropping China from our sample. The results are preserved qualitatively.

The empirical results could provide some new ideas for policy makers. Naturally, policies targeted to improve social values may be a bit of a stretch. However, countries abundant in social values such as trust but a lack of financial development can try to exploit their social values; they can, for instance, make sure that the informal credit market is smoothly functioning, which might improve their exports and subsequently economic development. These governments can also encourage firms to seek informal capital resources and remove the obstacles that may discourage them to do so. Furthermore, for more pointed policy designs, it would be desirable to investigate the characteristics of different types of product, and identify the kind of social values that would be most effective.

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Table2.1.Statistics of Trust Variables by Wave

	Obs	Mean	Std. Dev.	Within group Std.Dev.	Min	Max
Other people						
Wave 3	35	0.27	0.15	-	0.03	0.65
Wave 4	22	0.28	0.17	-	0.08	0.66
Wave 5	30	0.26	0.17	-	0.04	0.68
Total	84	0.27	0.16	0.03	0.03	0.68
Family and friends						
Wave 3	35	0.38	0.15	-	0.16	0.70
Wave 4	22	0.43	0.16	-	0.18	0.72
Wave 5	30	0.46	0.14	-	0.20	0.78
Total	87	0.42	0.15	0.04	0.16	0.78

Table 2.2 Statistics of Formal Credit

	Obs	Mean	Std. Dev.	No. of less financially developed	No. of financially developed
Credit					
Wave 3	35	77.69	81.79	-	-
Wave 4	22	88.23	86.41	-	-
Wave 5	30	95.01	81.87	-	-
Total	87	86.44	82.41	-	-
Credit Dummy					
Wave 3	35	0.51	0.51	18	18
Wave 4	22	0.18	0.39	4	18
Wave 5	30	0.37	0.49	11	19
Total	87	0.38	0.49	-	-

Table 2.3a Mean of Exports by Categories of Financial Variables

Wave	3	4	5	Total
2dgt product				
Credit=0	18.85	16.04	25.37	20.27
Credit=1	6.39	4.34	14.04	9.45
3dgt product				
Credit=0	9.28	8.20	12.68	10.12
Credit=1	3.61	2.70	7.66	5.31

Note: Country-pair exports are in million constant US$ (Year 2000=100).

Table 2.3b Mean of Exports by Categories of Financial Variables without China

Wave	3	4	5	Total
2dgt product				
Credit dummy=0	17.37	13.64	19.56	16.87
Credit dummy=1	6.39	4.34	14.04	9.45
3dgt product				
Credit dummy=0	8.90	7.06	9.87	8.62
Credit dummy=1	3.61	2.70	7.66	5.31

Note: Country-pair exports are in million constant US$ (Year 2000=100).

Table 2.4a Statistics of Trust Variables by Credit Categories

	Other People				Family and Friends			
Wave	3	4	5	Total	3	4	5	Total
Credit=0								
Obs	17	18	19	54	17	18	19	54
Mean	0.34	0.30	0.30	0.32	0.42	0.43	0.46	0.44
Std. Dev.	0.17	0.17	0.19	0.18	0.13	0.14	0.13	0.13
Max	0.65	0.66	0.68	0.68	0.64	0.72	0.67	0.72
Min	0.03	0.09	0.05	0.03	0.19	0.18	0.23	0.18
Credit=1								
Obs	18	4	11	33	18	4	11	33
Mean	0.20	0.19	0.18	0.19	0.35	0.42	0.45	0.39
Std. Dev.	0.08	0.11	0.11	0.09	0.16	0.27	0.15	0.17
Max	0.38	0.31	0.43	0.43	0.70	0.68	0.78	0.78
Min	0.05	0.08	0.04	0.04	0.16	0.18	0.20	0.16

Table 2.4b Statistics of Trust Variables by Credit Categories without China

	Other People				Family and Friends			
Wave	3	4	5	Total	3	4	5	Total
Credit=0								
Obs	16	17	18	51	16	17	18	51
Mean	0.33	0.29	0.29	0.30	0.43	0.45	0.48	0.45
Std. Dev.	0.18	0.17	0.18	0.17	0.12	0.12	0.13	0.13
Min	0.65	0.66	0.68	0.68	0.64	0.72	0.67	0.72
Max	0.03	0.09	0.05	0.03	0.19	0.29	0.23	0.19
Credit=1								
Obs	18	4	11	33	18	4	11	33
Mean	0.20	0.19	0.18	0.19	0.35	0.42	0.45	0.39
Std. Dev.	0.08	0.11	0.11	0.09	0.16	0.27	0.15	0.17
Min	0.38	0.31	0.43	0.43	0.70	0.68	0.78	0.78
Max	0.05	0.08	0.04	0.04	0.16	0.18	0.20	0.16

Table 2.5 Correlation of Export and Trust Variables by Financial Development Category

	Other People	Family and Friends
2dgt product Credit Dummy=0	0.035	-0.035
2dgt product Credit Dummy=1	0.044	0.014
3dgt product Credit Dummy=0	0.027	-0.030
3dgt product Credit Dummy=1	0.032	0.010

Table 2.6a Estimation using Total Exports

	Total Exports			
VARIABLES	2dgt		3dgt	
Credit	-0.271	-0.147	-0.0635	-0.0112
	(0.400)	(0.406)	(0.267)	(0.271)
Creditdummy*trust_ppl	0.144		0.0943	
	(0.127)		(0.0837)	
Creditdummy*trust_ff		0.112		0.104
		(0.224)		(0.149)
Exporter fixed effect	Yes	Yes	Yes	Yes
Wave fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observations	2,565	2,565	5,896	5,896
R-squared	0.972	0.972	0.965	0.965
RMSE	1.922	1.925	1.943	1.943

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table 2.6b Estimation in Two Digit Bilateral Exports

	Exports			
	With China		Without China	
VARIABLES	(1)	(2)	(3)	(4)
Credit	0.251***	0.470***	0.111	0.252***
	(0.0772)	(0.0775)	(0.0818)	(0.0870)
Creditdummy*trust_ppl	0.0947***		0.132***	
	(0.0219)		(0.0233)	
Creditdummy*trust_ff		-0.0555		0.111**
		(0.0438)		(0.0518)
Exporter's GDP	1.748***	1.835***	0.859***	0.838***
	(0.105)	(0.111)	(0.151)	(0.178)
Importer's GDP	0.772***	0.782***	0.814***	0.813***
	(0.0806)	(0.0807)	(0.0847)	(0.0847)
Contiguity	0.518***	0.519***	0.859***	0.838***
	(0.0411)	(0.0411)	(0.0434)	(0.0434)
Language	0.287***	0.287***	0.285***	0.283***
	(0.0251)	(0.0251)	(0.0256)	(0.0256)
Colonizer post 1945	0.895***	0.903***	0.750***	0.750***
	(0.165)	(0.165)	(0.167)	(0.167)
War	-0.984***	-0.980***	-0.927***	-0.916***
	(0.174)	(0.174)	(0.179)	(0.179)
Colonial relationship	1.124***	1.124***	1.063***	1.062***
	(0.131)	(0.131)	(0.132)	(0.132)
Common legal origin	0.480***	0.481***	0.503***	0.505***
	(0.0178)	(0.0178)	(0.0184)	(0.0184)
Common currency	-0.565**	-0.573**	-1.031***	-1.034***
	(0.228)	(0.228)	(0.232)	(0.232)
GATT	0.432***	0.411***	0.488***	0.493***
	(0.0380)	(0.0384)	(0.0432)	(0.0432)
Landlocked	-0.0687	-0.0693	-0.0948	-0.0981
	(0.186)	(0.186)	(0.187)	(0.188)
Coasts	0.381**	0.382**	0.363**	0.365**
	(0.174)	(0.174)	(0.176)	(0.176)
Bus.costs	0.0735***	0.0764***	0.0284	0.0360
	(0.0233)	(0.0233)	(0.0246)	(0.0247)
Bilateral distance	-1.641***	-1.642***	-1.637***	-1.637***
	(0.0124)	(0.0124)	(0.0127)	(0.0127)
Trariff	-0.101***	-0.101***	-0.101***	-0.101***
	(0.00706)	(0.00706)	(0.00715)	(0.00716)
Exporter fixed effect	Yes	Yes	Yes	Yes
Importer fixed effect	Yes	Yes	Yes	Yes
Wave fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observations	132,715	132,715	125,028	125,028
R-squared	0.841	0.841	0.832	0.832
RMSE	2.482	2.482	2.498	2.499

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2.6c Estimation in Three Digit Bilateral Exports

VARIABLES	Exports			
	With China		Without China	
	(1)	(2)	(3)	(4)
Credit	0.259***	0.497***	0.106*	0.267***
	(0.0565)	(0.0564)	(0.0602)	(0.0640)
Creditdummy*trust_ppl	0.0881***		0.125***	
	(0.0157)		(0.0167)	
Creditdummy*trust_ff		-0.0904***		0.0856**
		(0.0320)		(0.0381)
Exporter's GDP	1.891***	1.998***	0.853***	0.880***
	(0.0743)	(0.0781)	(0.109)	(0.130)
Importer's GDP	0.543***	0.550***	0.570***	0.569***
	(0.0330)	(0.0331)	(0.0347)	(0.0347)
Contiguity	0.475***	0.475***	0.554***	0.556***
	(0.0281)	(0.0281)	(0.0297)	(0.0297)
Language	0.256***	0.256***	0.251***	0.250***
	(0.0183)	(0.0183)	(0.0187)	(0.0187)
Colonizer post 1945	1.000***	1.010***	0.830***	0.831***
	(0.112)	(0.112)	(0.113)	(0.113)
War	-0.915***	-0.911***	-0.854***	-0.844***
	(0.118)	(0.118)	(0.121)	(0.121)
Colonial relationship	1.022***	1.021***	0.988***	0.986***
	(0.0885)	(0.0885)	(0.0893)	(0.0893)
Common legal origin	0.465***	0.465***	0.493***	0.495***
	(0.0130)	(0.0130)	(0.0135)	(0.0135)
Common currency	-0.238	-0.245	-0.603***	-0.607***
	(0.158)	(0.158)	(0.161)	(0.161)
GATT	0.408***	0.384***	0.463***	0.469***
	(0.0272)	(0.0275)	(0.0312)	(0.0312)
Landlocked	-0.769***	-0.769***	-0.763***	-0.766***
	(0.147)	(0.147)	(0.147)	(0.147)
Coasts	0.906***	0.906***	0.843***	0.845***
	(0.138)	(0.138)	(0.139)	(0.139)
Bus.costs	0.0316*	0.0345**	-0.0208	-0.0134
	(0.0170)	(0.0170)	(0.0181)	(0.0181)
Bilateral distance	-1.494***	-1.494***	-1.486***	-1.486***
	(0.00888)	(0.00888)	(0.00914)	(0.00914)
Trariff	-0.104***	-0.105***	-0.105***	-0.105***
	(0.00531)	(0.00531)	(0.00538)	(0.00538)
Exporter fixed effect	Yes	Yes	Yes	Yes
Importer fixed effect	Yes	Yes	Yes	Yes
Wave fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Observations	259,674	259,674	242,543	242,543
R-squared	0.803	0.803	0.792	0.792
RMSE	2.505	2.505	2.517	2.517

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

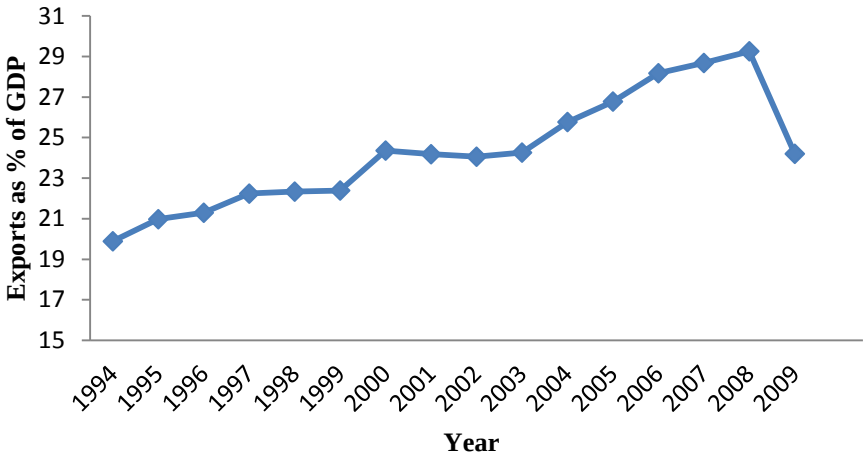

Figure 2.1 World's Exports of Goods and Services (% of GDP), From UN COMTRADE

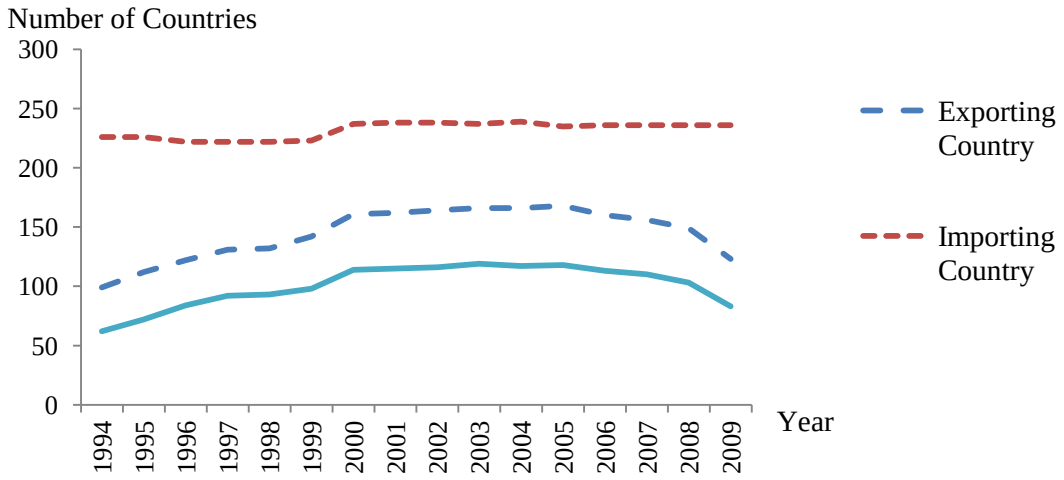

Figure 2.2 The Number of Trade Partners in International Trade, From UN COMTRADE

Appendix

Table A2.1 Country list by wave

Wave		
3	4	5
Azerbaijan	Argentina	Argentina
Argentina	Bangladesh	Australia
Australia	Canada	Brazil
Bangladesh	Chile	Bulgaria
Brazil	China	Canada
Bulgaria	India	Chile
Chile	Indonesia	China
China	Japan	Cyprus
Colombia	Jordan	Georgia
Croatia	Mexico	Ghana
Czech Republic	Morocco	India
Dominican Republic	Nigeria	Indonesia
El Salvador	Pakistan	Japan
Estonia	Peru	Jordan
Finland	Philippines	Malaysia
Germany	Saudi Arabia	Mexico
Hungary	Singapore	Morocco
India	South Africa	New Zealand
Japan	Sweden	Peru
Latvia	Turkey	Poland
Lithuania	Uganda	Russian Federation
Mexico	Zimbabwe	South Africa
New Zealand		Sweden
Nigeria		Switzerland
Norway		Thailand
Peru		Trinidad and Tobago
Philippines		Turkey
Poland		Ukraine
Russian Federation		Uruguay
South Africa		Zambia
Spain		
Sweden		
Switzerland		
Turkey		
Ukraine		
Uruguay		

CHAPTER III

FINANCIAL REFORMS AND EXPORTS: AN INVESTIGATION WITH MULTIPLE REFORM MEASURES

Abstract

In this paper, we use a new database about financial reforms from Abiad et al. (2010) to evaluate how the level of financial liberalization affects exports. In our specification we follow Manova (2008a) and examine the impact of the summary measure of financial reform (a normalized reform score), and seven individual reform measures. High level of liberalization directly increases exports; shifts exports up if it works as providing new channels for credit, but shifts exports down if it represses the accessibility of external capital. We also find that the liberalization effects are stronger in sectors with higher external financial dependence, or smaller shares of tangible assets. The results are robust in a sample without China.

I. Introduction

There exists an extensive literature investigating the relationship between financial development and economic growth. Hassan, Sanchez and Yu (2011) use six financial indicators and find strong positive connection between financial development and GDP per capita in developing countries. Bekaert, Harvey and Lundblad (2005) find that equity market liberalization could raise real economic growth rate by 1.2%. Levine, Loayza and Beck (2000) not only demonstrate such positive link, but also find that financial development can be promoted by legal reforms that eventually stimulate economic growth. In this paper, we want to examine if financial development could exhibit similar impact on exports as it does on GDP growth. Note that growth in trade itself contributes towards GDP growth.

The endowment of factors, such as labor or working capital is important in determining trade flows. Manova (2008b) proposes the idea that exporting firms are restricted by initial entry costs which are supposed to be higher than that to enter the domestic market. Whether firms can access sufficient external financial support is a crucial factor that determines the extensive (the number of firms) and intensive (quantity of each commodity) margins of exports. Apart from firm's characteristics, country's financial development also accounts for the accessibility and quantity of external capital (Levine 2004).

Beck (2002) theoretically and empirically concludes that high level of financial development is also part of a comparative advantage for a country, and manufacturing exports as a share of total GDP increases as financial development rises. Chang, Hung and Lu (2005) confirm Beck's model that the share of exports in GDP is higher in

countries with an advanced financial system. Hur, Raj and Riyanto (2006) find similar results.

There are many measures of financial development that have been used in studies analyzing the relationship between financial development and trade. The domestic credits issued by banks as a percentage of GDP from the World Development Indicator is widely used as a proxy for the financial development level. For instance, Manova (2008b), Berthou (2007), Rajan and Zingales (1998), Chang, Hung and Lu (2005), Hur, Raj and Riyanto (2006), Beck (2002), all use this indicator as a measure of financial development.

Aside from measures to enhance availability of formal private credits, financial liberalization could be an alternative measure determining access to capital. Manova (2008a) and Bekaert, et al. (2005) uses equity market liberalization as the policy measure that affects access to capital and thereby has an effect on exports (Manova, 2008a). In these papers four proxies are employed: official and first-sign market liberalization indicator and their intensity indicator respectively, to capture the liberalization of equity market.

Other measures such as openness of capital account can also represent financial liberalization (Bekaert et al. ,2005; Klein and Olivei, 2008).

There are several studies associating financial liberalization with economic growth (Bekaert et al., 2005; Gimra, 2009; Klein and Olivei, 2008; Ranciere, Tornell and Westermann, 2006). Excluding Manova (2008a), there do not exist in many studies linking financial liberalization and international trade. As discussed above Manova (2008a) focuses on effect of equity market liberalization to industry level exports. She

concludes that with a liberalized equity market, firms can acquire capital at lower costs, increase investment and make capital allocation more efficient. In addition, she associates equity market liberalization with financial dependency and share of tangible assets in different sectors finding that financial liberalization has greater marginal effect on exports in sectors with a higher level of financial dependence, and a lower level of tangible assets. The results are explained as follows: considering the impact of financial on firms in the sectors with greater dependence on external capital; such firms would have a better chance to borrow capital in a liberalized market. In case of tangible assets, usually defined as real estate, plants and machines, they are used as collateral; firms with greater shares of tangible assets can borrow more easily. Hence, for sectors with more tangible assets, the potential effects of liberalization are likely to be smaller.

In this paper, we examine the findings in Manova (2008a) and Hur, Raj and Riyanto (2006) with a substantially broader concept of financial liberalization. Equity market liberalization covers only one part of the capital market and is thereby not sufficient to fully reflect the overall effect of financial liberalization. With this broader set of financial liberalization measures, we want to study how liberalization affects exports through different channels, specifically financial policies, and capture the additional impact in sectors with different levels of financial vulnerability. Therefore, we choose the extensive set of financial reforms indicators in Abiad et al. (2010) and examine their effect at the sector level international trade.

The financial reforms database developed by Abiad et al. (2010) includes seven measures for a country's financial reforms related to credit controls and excessively high reserve requirements, interest rate controls, entry barriers, state ownership in the banking

sector, capital account restrictions, prudential regulations and supervision of the banking sector, and securities market policies. Note that although different from the source in Manova (2008a), the measures also include aspects of equity market reforms. In Abiad et al. (2010), the equity market reforms are reflected in indicators related to securities markets policies. The overall financial reforms is the summation of seven dimensions' scores standardized to describe the level of country's overall reform status. Compared with other financial reform databases, Abiad et al. (2010) dataset has several advantages. First, it covers a wide range of countries and years – 91 countries from 1973 to 2005 – whereas Williamson and Mahar (1998) has 34 countries ranging from 1973 to 1996; Kaminsky and Schmukler (2003) construct a dataset with 28 countries from 1973 to 1999.

Secondly, Abiad et al. (2010) provide a comprehensive dataset in terms of several indicators. It evaluates the reform from seven dimensions of financial policies. By contrast, Williamson and Mahar (1998) define six variables which mainly analyze the capital flows. Finally, each reform indicator in this database has a graded score which is better to measure the financial liberalization level. In Laeven (2003), reforms are measured as a binary variable and thereby cannot capture the intensity of reforms.

With the different indicators of reforms we can analyze the effects from specific facets of financial reforms/policies that have an effect on exports. A priori of the effect of financial reforms need not be unambiguously positive on exports. Consider for example, deregulation of interest rate controls or priority sector lending for export sectors, reforms in this case could hurt rather than promote exports. Similarly, countries with low rates of savings could help their export sector through liberalization of international capital

inflows. Such cross-measure differences can be assessed with this new dataset which has not been feasible for the earlier papers.

We thus extend Manova (2008a) to a much broader set of financial reforms and also cover a longer period of time. We implement two sets of regressions: the global sample and a sub-sample without China. Due to the volume and coverage of export commodities, China is clearly an extraordinary exporter. Also, China has special regulations on the mechanism and liberalization of financial market.

We estimate the effect of financial reforms on exports both in terms of the overall index of reforms as well as individual reform indicators. As in earlier papers, we interact the reform measures with financial dependency and tangible assets in terms of reconstructed dummy variables. We find that there is a strong positive link between financial reforms and exports at the industry level. Thus, what has been shown for some aspects of reform tends to hold in terms of overall reforms.

In case of individual indicators there is a significant departure from the earlier results where not all reforms are found to unequivocally increase exports. The difference comes precisely in terms of measures that have not been considered earlier. Individual indicators like credit controls, interest rates and banking supervision actually show negative effects, because the liberalization in these fields may eliminate some benefits from government interventions in the form of soft or priority sector lending. A developed and open equity market improves allocation of external capital; free capital flows enhance liquidity and quantity of foreign capital; both of these have significantly positive effects on exports. The finding that the effect of reform varies by sectors depending on

their external capital dependency and asset tangibility corroborates the findings in Manova (2008a) though with the qualification that not all reforms are export enhancing. The paper is structured as follows: section II presents the data and descriptive statistics of key variables that are later used in the regression analysis; section III presents the estimation strategy; section IV provides the findings; the last section concludes.

II. Data and Descriptive Statistics

The dependent variable in the analysis is exports in industrial sectors by country and year. Exports data is collected from three digit level of ISIC Revision2 from UN Comtrade. Trade values have been deflated using United States CPI with the base year 2000.

As discussed above Abiad et al. (2010) construct a new database of financial reforms which records precisely country's financial liberalization levels from seven dimensions to evaluate the financial system. This dataset covers 91 countries ranging from 1973 to 2005. The seven dimensions are described as follows:

- Credit controls and excessively high reserve requirement: Credit control includes two parts: the credit ceiling that restricts the maximum of lending to a specific sector; minimum credits to certain sector, and/or with subsidized interest rate. Central banks also impose high reserve requirements to commercial banks in order to adjust capital in markets.
- Interest rate controls: governments may restrict both lending and deposit rate by setting interest rate ceiling or floor instead of market rates.

- Entry barriers: governments may limit foreign financial institutions to enter domestic financial markets by restricting their activities, having strict licensing requirements, etc. New domestic banks may encounter similar barriers as well.
- State ownership in the banking sector: Represented as the proportion of banks that are state owned, and/or the percentage of public bank assets. Government can directly control capital in markets if it possesses a great share of banks' ownership.
- Capital account restrictions: by controlling exchange rates, capital inflows, and capital outflows government could restrict international capital transaction.
- Prudential regulations and supervision of the banking sector: A series of standard is applied to score the effective of country's banking supervision.
- Securities market policy: if government encourages the securities markets' development, and increases the openness to foreigners, then the country is considered liberalized.

The score for each measurement is computed based on related survey questions, and the final score is adjusted into four categories: fully repressed=0, repressed=1, largely liberalized=2 and fully liberalized=3. For the first five measurements, if the country indeed applies relevant policies in the corresponding field, then it is assigned a status of "fully repressed or repressed" in that such policies prevent external capital from free transaction and allocation. For instance, if central bank raises the reserve requirements, banks have to deposit more capital into central bank and lend out less than before. Banking supervision and securities markets policy encourage the development of financial markets by regulating markets to be efficient and attracting new investors, especially foreigners who bring in external capital.

Overall financial reform is the summation of seven scores, and its value lies in the interval 0 to 21. It is normalized and the value is from 0 (fully repressed) to 1(fully liberalized). For convenience, we also convert the individual indicators into binary variables which equal 1 if the corresponding indicator is labeled as "fully liberalized" or "liberalized", 0 otherwise. We can consider a country is liberalized if its reform dummy is equal to 1.

Following earlier literature we choose the external financial dependence and asset tangibility at the industry level. The data is obtained from Braun (2003). The former is the ratio of capital expenditures minus cash flow from operations to capital expenditures and the latter is the share of net property, plant and equipment in total book-value assets. The value is based on the median firm in each sector in the U.S. The data has been compiled based on Compustat for different years.

In our sample, there are 84 countries between 1973 and 2005 in 28 industry/ sectors. Table 3.1 provides some descriptive statistics of the dependent and independent variables used in the regressions below. Exports and GDP of exporting countries are presented in logarithms (GDP in constant 2000 USD). Individual reform indicators are binary variables. The statistics present the percentage of liberalized countries in terms of specific reform measure overtime. Overall, the interest rate controls are the least common with 70% of country-year observations not having them. In contrast, banking supervision has the highest coverage.

Table 3.2 presents the correlations between exports and individual financial reform variables. Financial reform score and each reform indicators are positively

correlated with industry-level exports to varying degrees. The openness of securities market has the highest positive correlation with trade. We can interpret this as: in an open and active securities market, on the one hand borrowers can easily receive external financial support by issuing securities, and on the other hand, lenders would like to invest in the securities markets that are more open. Foreign investment can also enter the market and enhance external capital. Entry barriers for banks have the minimum correlation with exports.

Table 3.3a presents the mean value of exports in different reform categories by different reform indicators. For countries with liberalized financial indicator, the average exports are significantly higher. The widest gap between two groups is in the case of openness of the securities market. Here, the values of exports on average are up to 8.6 times the non-liberalized group. The number of observations in general is higher for the reform groups except in case of banking supervision.

We have argued that China is an exceptional exporter which takes up a large portion of international trade and is active in all sectors. China's exports cover all 28 sectors and the values are available from 1985 to 2005. Table 3.3b describes the exports in different reform categories for China. In case of entry barriers, state ownership of banks, and capital account, over the years China is generally classified as not liberalized. Restrictions on interest rate and openness of securities market do not qualify as liberalized until 2004. The financial reform score is as low as 0.22 compared with the sample mean which is 0.58. Yet, in spite of a flourishing export market, the financial market in China has largely been based repressed on the broad set of indicators. That motivated us to look at the results without China in the sample.

III. Model

We augment the specification in Manova (2008a) for a multiple set of indicators of financial reform and also extend it to a longer period of time. The generalized difference-in-difference approach in Manova (2008a) involves interacting equity market openness with two financial variables viz. external financial dependence and tangible assets. In this paper, equity market openness is supplemented with an extensive set of financial reform indicators with an aim to discern the effect of the individual components of financial reform separately.

The export values are at the country and time level; the financial variables are sectoral while the financial reform variables are also at country time level. The interaction variables capture both sector and country level variation over time. Financial reforms take two forms in our specification: one is in its original value to directly reflect how the active reform policies improve trade; the second is in terms of a binary variable that equals 1 if a single reform measure is recorded as "liberalized". The latter includes seven reform indicators and each of them not only shows individual effects but also is interacted with external financial dependence and asset tangibility to examine the differential effects based on financial vulnerability. The specification that we implement is given as:

$$\begin{aligned} Exports_{cit} = {} & \alpha_0 + \alpha_1 GDP_{ct} + \beta_0 Fin.reform_{ct} + \beta_1 Fin.reform\_dum_{ct} + \\ & \beta_2 Fin.reform\_dum_{ct} \times Fin.dep_i + \beta_3 Fin.reform\_dum_{ct} \times Tang_i \\ & + \eta_c + \eta_i + \eta_t + \varepsilon_{cit} \end{aligned} \tag{1}$$

Exports is the value in country *c* in sector *i* and in year *t*. Exporter's annual GDP is deflated (base year=2000) and controls for the effect from the economic size. We expect the sign of the first interaction term to be positive in that a liberalized financial system is more capable of efficient allocation of capital. For industries with high dependence on external capital, they are likely to be benefited more from a financial market with fewer restrictions on capital allocation and lending. The second interaction variable is expected to be negative because of the characteristics of tangible assets. Usually tangible assets are classified as fixed assets, for example, building, equipments, etc., and can work as collateral when firms borrow capital from external resources. High asset tangibility reduces the firm's dependence on the development of financial market while borrowing. Industries with a large share of tangible assets are thus expected to benefit less from a liberalized market compared to those with small share.

The specification controls for several unobserved factors with exporter, industry and time fixed effects denoted η_c, η_i, η_t respectively.

IV. Results

Estimation results are presented in Table 3.4a. There are seven columns each presents the regression of an individual financial reform measure.

First, overall financial reform score significantly contributes to exports. The score of financial reforms reflects the liberalization level of country's entire financial market. Countries with high score possess relatively liberalized and developed financial market and in these countries export firms have an advantage in receiving external finance.

Different from financial reform score, binary reform variables evaluate a specific financial policy towards liberalization (=1), or repression (=0). We will explain below each indicator's performance in detail.

Credit controls, interest rate, and banking supervision decrease exports when they are graded as "liberalized". Credit controls comprises four components: direct credits, subsidized interest rate, reserve requirement and credit ceilings. The first two address the fact that some sectors have priority in accessing external capital through government policy by having targeted credits, and/or subsidized interest rates. Exporting sector is one of such sectors, and targeted credits and special rates are parts of export subsidy methods (Kelly, 2009). For example, agriculture products (including agro processing) are often subsidized by governments for exports (Anania, 1992; Paarlberg, 1995; Girma, Gorg and Wagner, 2009). Many studies find a positive link between export subsidies and trade volumes (Zia, 2008; Girma et al., 2009). Besides, subsidy-related questions weigh at least 50% in coding credit control's score so that it is reasonable to assume that this reform measure emphasizes official credit disbursement. Since the liberalization in credit controls actually reduces the quantity and possibility for export firms to receive favorable financial support, we believe that could explain the negative effect.

For the effect of restriction on interest rate, we can explain it from two sides: if interest rate is controlled by the central bank, commercial lenders lose the ability to adjust according to the demand-supply balance in the markets; on the other hand, it prevents rates from increasing too fast or get too high. Export firms can benefit from the second effect, by which they could borrow external capital with less interest rate risks.

Similarly, banking supervision possibly has different effects on markets. A well regulated and supervised financial system helps establish a healthy capital and credit market. At the same time it can restrict innovations in financial sector which can increase the efficiency of capital allocation. As an industry with more external capital support (Manova, 2008b), less restrictions allow firms to get credits with fewer constrains.

Entry barriers and state-owned banks do not directly affect the distribution of external capital, so liberalization in these two policies show little impact on exports.

Liberalization in country's capital account and securities markets show strong effects on exports. Butkiewiez and Yanikkaya (2008) find positive connection between liberalization in capital account and economic growth; and FDI is also positively affected by capital account liberalization. Additionally, an open capital account allows freer inflow and outflow of capital, and in turn it could prop international trade from this channel as well. From the coding on securities markets, it is considered liberalized if government promotes the development of securities markets, and/or foreigners are permitted to invest in equity market. The liberalized indicators all attempt to capture introduction of new capital into markets. The effect from liberalized securities market is in fact greater than other reforms that have a positive effect.

When checking the effects of reforms in sectors with different levels of financial vulnerability, we find across all reform measures, financial liberalization effects are always stronger in industries with high external financial dependence. For sector with lower shares of tangible assets, again form is more beneficial; the effects are, however, less strong compared to those in of external financial dependence. The empirical results

confirm our assumption in previous section. For example, with an open securities markets, a 10% increase in sector's financial dependence leads to 10.66% increase in exports.

We also estimate a smaller sample excluding China, and get similar results as the full sample (Table 3.4b).

V. Conclusion

There have been several studies that explore the link between financial development and international trade where most of them use private credits as proxy for development (Manova, 2008b; Berthou 2007; Chang, Hung and Lu, 2005; Hur, Raj and Riyanto, 2006; Beck, 2002). Manova (2008a) explores a new measure by using equity market liberalization to capture its effects on industry-level exports. However, in this paper we take the view that financial reforms beyond equity market liberalization could also play a role in determining exports of a country.

In our research, we employ a comprehensive database of financial reforms as measures of financial liberalization based on Abiad et al. (2010). There are seven reform measures, and the summation of them depicts country's overall financial liberalization level. We extend the specification in Manova (2008a), and find new empirical evidence to support the link between liberalization and exports.

By applying difference-in-difference approach, we find that in general exports increase with financial reforms. Yet, in terms of specific reforms the effects are diverse. Credit controls, restrictions on interest rate, and banking supervision actually decrease

exports if they are liberalized. Preferential lending is one conjecture that we offer in explaining this effect. Openness of capital account and securities markets introduce new capital into the market as well as increase trade opportunities. Exports are benefited from the liberalization in these two measures. Interacting with financial vulnerability variables, liberalized indicators have greater effect on exports in sectors with high financial dependence and those with fewer tangible assets.

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Table 3.1 Descriptive Statistics of Variables

Variable	Label	Obs	Mean	Std.Dev.	Min	Max
Trade						
Export	Deflated Annual Exports	47772	11.10	3.42	-6.85	19.14
GDP	Deflated Annual GDP	47772	8.36	1.51	4.81	11.09
Industry Financial Structure						
Fin.Dep.		840	0.24	0.32	-0.45	1.14
Tangibility		840	0.30	0.14	0.07	0.67
Financial Reforms						
Fin.Reform index	Financial Reform Indices	1748	0.58	0.29	0	1
Binary measures of individual financial reform						
Credit Controls		1748	0.57	0.50	0	1
Interest Rate		1748	0.70	0.46	0	1
Entry Barriers		1748	0.64	0.48	0	1
Banking Superv		1748	0.30	0.46	0	1
Privatization		1748	0.47	0.50	0	1
Capital Account		1748	0.62	0.49	0	1
Securities Market		1748	0.58	0.49	0	1

Notes: There are three data sets: (1) ISIC3 revision 2, trade data, from UN COMTRADE (2) Data on the industry financial structure at ISIC3 revision 2 level from Braun (2003), and (3) Data on financial reform from Abiad, Detragiache, and Tressel (2010).

Table 3.2 Correlations among Exports and Reform Indicators

	Exports	Fin. Reforms	Credit Controls	Interest Rate	Entry Barriers	Banking Superv	Privati -zation	Capital Account	Securities Market
Exports	1.00								
Fin.Reforms	0.38	1.00							
Credit Controls	0.20	0.67	1.00						
Interest Rate	0.23	0.74	0.53	1.00					
Entry Barriers	0.17	0.69	0.37	0.45	1				
Banking Superv	0.27	0.64	0.40	0.38	0.36	1			
Privatization	0.19	0.62	0.36	0.34	0.36	0.31	1		
Capital Account	0.29	0.73	0.44	0.55	0.45	0.39	0.39	1	
Securities Market	0.46	0.67	0.38	0.43	0.37	0.40	0.28	0.55	1

Table 3.3a Average Value of Exports by Different Category of Reform Indicators

	*Exports			
	Reform=0	Obs.	Reform=1	Obs.
Credit Controls	842.57	20226	2633.00	27546
Interest Rate	758.04	13996	2337.78	33776
Entry Barriers	1376.94	16829	2145.81	30943
Banking Superv	1066.86	33042	3687.65	14730
Privatization	1371.93	24979	2426.22	22793
Capital Account	625.38	17869	2621.66	29903
Securities Market	359.80	19595	2928.63	28177

* Exports are in 1,000,000 constant USD.

Table 3.3b Average Value of Exports by Different Category of Reform Indicators in China

	*Exports			
	Reform=0	Obs.	Reform=1	Obs.
Credit Controls	3164.10	342	12694.78	224
Interest Rate	5265.77	510	22146.58	56
Entry Barriers	6935.96	566	0	0
Banking Superv	2869.39	314	12003.04	252
Privatization	6935.96	566	0	0
Capital Account	6935.96	566	0	0
Securities Market	5265.77	510	22146.58	56

* Exports are in 1,000,000 constant USD.

Table 3.4a Estimation Results with Full Dataset

VARIABLES	Credit Controls	Interest Rate	Entry Barriers	Banking Superv	Privatization	Capital Account	Securities Market
GDP	0.0958***	0.0867***	0.105***	0.173***	0.0977***	0.0985***	0.0511*
	(0.0300)	(0.0300)	(0.0299)	(0.0306)	(0.0300)	(0.0300)	(0.0298)
Fin.Reforms	0.847***	0.960***	0.665***	0.878***	0.802***	0.724***	0.332***
	(0.0906)	(0.0913)	(0.0866)	(0.0794)	(0.0864)	(0.0895)	(0.0832)
Creditcontrols_dum	-0.104**						
	(0.0452)						
Creditcontrols_Fin.Dep.	0.800***						
	(0.0465)						
Creditcontrols_Tang	-0.479***						
	(0.109)						
Intratecontrols_dum		-0.349***					
		(0.0490)					
Intratecontrols_Fin.Dep.		0.796***					
		(0.0506)					
Intratecontrols_Tang		0.0768					
		(0.119)					
Entrybarriers_dum			-0.0540				
			(0.0467)				
Entrybarriers_Fin.Dep.			0.452***				
			(0.0482)				
Entrybarriers_Tang			0.103				
			(0.113)				
Bankingsuperv_dum				-0.290***			
				(0.0457)			
Bankingsuperv_Fin.Dep.				0.757***			
				(0.0496)			
Bankingsuperv_Tang				-0.605***			
				(0.117)			

(continued)

Privatization_dum					-0.0636		
					(0.0453)		
Privatization_Fin.Dep.					0.847***		
					(0.0459)		
Privatization_Tang					-0.575***		
					(0.108)		
Capitalacount_dum						0.145***	
						(0.0454)	
Capitalacount _Fin.Dep.						0.929***	
						(0.0474)	
Capitalacount _Tang						-1.151***	
						(0.111)	
SecuritesMKT _dum							0.650***
							(0.0453)
SecuritesMKT _Fin.Dep.							1.066***
							(0.0464)
SecuritesMKT _Tang							-1.519***
							(0.109)
Constant	6.179***	6.312***	6.071***	3.191***	6.178***	6.247***	6.676***
	(0.289)	(0.290)	(0.290)	(0.293)	(0.293)	(0.291)	(0.289)
Observations	47,772	47772	47772	47772	47772	47772	47772
R-squared	0.777	0.777	0.776	0.777	0.777	0.778	0.780
Year FE	yes	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes	yes
Exporter FE	yes	yes	yes	yes	yes	yes	yes
MSE	1.620	1.621	1.623	1.619	1.619	1.617	1.609

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3.4b Estimation Results without China

VARIABLES	Credit Controls	Interest Rate	Entry Barriers	Banking Superv	Privatization	Capital Account	Securities Market
GDP	0.0648**	0.0592*	0.0772**	0.146***	0.0716**	0.0689**	0.0213
	(0.0305)	(0.0305)	(0.0304)	(0.0310)	(0.0304)	(0.0305)	(0.0303)
Fin.Reforms	0.924***	1.002***	0.685***	0.920***	0.833***	0.738***	0.366***
	(0.0913)	(0.0917)	(0.0871)	(0.0799)	(0.0869)	(0.0900)	(0.0835)
Creditcontrols_dum	-0.120***						
	(0.0457)						
Creditcontrols_Fin.Dep.	0.803***						
	(0.0469)						
Creditcontrols_Tang	-0.513***						
	(0.110)						
Intratecontrols_dum		-0.315***					
		(0.0496)					
Intratecontrols_Fin.Dep.		0.829***					
		(0.0514)					
Intratecontrols_Tang		-0.0752					
		(0.121)					
Entrybarriers_dum			-0.00165				
			(0.0472)				
Entrybarriers_Fin.Dep.			0.476***				
			(0.0489)				
Entrybarriers_Tang			-0.0424				
			(0.115)				
Bankingsuperv_dum				-0.310***			
				(0.0461)			
Bankingsuperv_Fin.Dep.				0.752***			
				(0.0501)			
Bankingsuperv_Tang				-0.566***			
				(0.118)			

(continued)

Privatization_dum					-0.0312		
					(0.0456)		
Privatization_Fin.Dep.					0.866***		
					(0.0463)		
Privatization_Tang					-0.680***		
					(0.109)		
Capitalacount_dum						0.201***	
						(0.0459)	
Capitalacount _Fin.Dep.						0.962***	
						(0.0480)	
Capitalacount _Tang						-1.313***	
						(0.113)	
SecuritesMKT _dum							0.692***
							(0.0457)
SecuritesMKT _Fin.Dep.							1.090***
							(0.0469)
SecuritesMKT _Tang							-1.648***
							(0.110)
Constant	7.478***	9.962***	10.10***	5.802***	9.948***	9.915***	10.37***
	(0.292)	(0.309)	(0.308)	(0.311)	(0.307)	(0.310)	(0.307)
Observations	47,206	47206	47206	47206	47206	47206	47206
R-squared	0.775	0.775	0.774	0.775	0.775	0.776	0.778
Year FE	yes	yes	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes	yes	yes
Exporter FE	yes	yes	yes	yes	yes	yes	yes
MSE	1.623	1.624	1.627	1.623	1.622	1.620	1.612

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A3.1 List of Countries in Sample

Albania	Finland	Nepal
Algeria	France	Netherlands
Argentina	Georgia	New Zealand
Australia	Germany	Nicaragua
Austria	Ghana	Nigeria
Azerbaijan	Greece	Norway
Bangladesh	Guatemala	Pakistan
Belarus	Hong Kong, China	Paraguay
Belgium	Hungary	Peru
Bolivia	India	Philippines
Brazil	Indonesia	Poland
Bulgaria	Ireland	Portugal
Burkina Faso	Israel	Russian Federation
Cameroon	Italy	Senegal
Canada	Jamaica	Singapore
Chile	Japan	South Africa
China	Jordan	Spain
Colombia	Kazakhstan	Sri Lanka
Costa Rica	Kenya	Sweden
Cote d'Ivoire	Korea, Rep.	Switzerland
Czech Republic	Kyrgyz Republic	Thailand
Denmark	Latvia	Tunisia
Dominican Republic	Lithuania	Turkey
Ecuador	Madagascar	United Kingdom
Egypt, Arab Rep.	Malaysia	United States
El Salvador	Mexico	Uruguay
Estonia	Morocco	Venezuela
Ethiopia(excludes Eritrea)	Mozambique	Zimbabwe

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Scope and Method of Study: The first essay explores if depreciation of housing assets leads to changes in household's consumption and asset allocation that are symmetrically opposite to those in response to housing asset appreciation. I look for evidence in Indonesia over the period 1993 to 2007. Housing values and the probability of owning debt are predicted in a first stage estimation to reduce the self-reporting errors. The rate of return on housing assets is decomposed into two categories – appreciation and depreciation. The second essay focuses on the effects of trust on exports. Exports may be limited by a country's level of financial development level. Trust works as a proxy for informal credit resources and supplement formal credit resources to reduce financial constraints. By interacting domestic trust with a financial development indicator I examine if trust exhibits additional contribution to exports in countries with lower levels of financial development. The third essay examines the relationship between a country's level of financial reforms and exports. Using a comprehensive financial reform dataset, I examine the effect of liberalization on exports from each dimension as well as their additional contributions in sectors with different level of financial dependence and asset tangibility. In both the second and the third essays, two and three digit export flows were used to mitigate potential endogeneity problems. Also, robustness checks by excluding China from the sample are carried out.

Findings and Conclusions: Firstly, I find that the depreciation of housing assets and volatility does not show economically significant effects on either household's consumption pattern or asset allocation. The conclusion that the collapse of housing market accompanying a financial crisis is responsible for decline in consumption does not necessarily follow. Secondly, financial development is positively related to exports. Trust increases exports in less financially developed countries by supplementing formal credit with informal capital resources, and the effects are more significant without China. Thirdly, greater levels of financial liberalization increase exports if the measure provides new channels of credits, and decreases exports if it represses accessibility of external capital. Effect of liberalization is more important in industries with higher financial dependence or less tangible assets.

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