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Consumption, financial wealth and labor income in Korea☆

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ABSTRACT

By examining the relationship between consumption, financial wealth and labor income in Korea, this paper presents three key findings. First, we find evidence that Korean households hold a larger proportion of their wealth in human capital instead of financial wealth, compared to households in other countries. Potentially, this finding appears consistent with Koreans' enthusiasm for human development through education despite low government funding. Another important finding is that only financial wealth fluctuations contain a large portion of temporary components. Hence, financial wealth is mainly responsible for adjustments to restore the long-run relationship between consumption, financial wealth and labor income during the examined period. Third, and perhaps most interestingly, this paper finds that before the 1997 Asian financial crisis, households in Korea had difficulty smoothing their consumption over time. This finding may be at least partly attributable to households' limited access to bank loans and their low level of financial wealth accumulation prior to the crisis. In contrast, we find little evidence that households' consumption behavior has changed during the recent global financial crisis.

1. Introduction

In recent years, linkages between wealth (financial wealth and human capital) and consumption have received increased attention both among academic researchers as well as policy-makers. This renewed interest is in part due to the recent boom in asset markets around the world, fueled by a sharp credit expansion, which largely contributed to the 2007–2008 global financial crisis. Numerous economic studies have focused on the response of consumption expenditures to the changes in household wealth—so-called wealth effect on consumption.[1] However, we analyze this relation from a different angle by decomposing the movements of three variables into permanent components (i.e., persistent trends) and temporary components (i.e., transitory cycles) using Korean data.

Accordingly, we estimate a cointegrated vector autoregressive (VAR) model with consumption, financial wealth and labor income after showing how unobservable human capital can be linked to observable labor income following Campbell (1993) and Lettau and Ludvigson (2004) among others. In doing so, this paper aims to address the following three key questions. First, what is the average proportion of human capital in Korean households' total wealth? According to recent data, the tertiary graduation rate of the 25–34 year-olds in Korea was the highest among OECD countries, despite the second-lowest level of public funding among OECD countries (OECD, 2011). In this context, it is interesting to analyze whether Korean households hold a higher proportion of human capital instead of financial wealth than households in other countries.

Second, if there is a long-run relationship among those three variables, which variable mainly adjusts to regain this relationship in Korea? To address this question, this paper analyzes the short-term dynamics among them in the cointegrated VAR model. In addition, as noted by Stock and Watson (1988) and Gonzalo and Granger (1995), the presence of r cointegrating relations in a p-dimensional VAR model implies $p - r$ permanent components in the model. Because this approach allows us to disentangle temporary components from permanent components in consumption, financial wealth and labor income, we can examine which variable contains a large portion of temporary movements and thus restores the long-run relationship.

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[1] See, for example, Altissimo et al. (2005) for advanced economies and Peltonen et al. (2009) for emerging market economies including Korea. Interestingly, using household level data in Korea, Cho (2006) finds evidence of a statistically significant stock market wealth effect in the highest income bracket households; however, the effects are insignificant for the other income brackets.

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Regarding the second question, perhaps, the most interesting question is whether the 1997 Asian financial crisis led to notable changes in the above adjustment process. This question is largely motivated by the fact that the crisis had a devastating impact on Korea, causing the worst recession since the Korean War. Moreover, immediately after the outset of the Asian financial crisis, the Korean central bank and government implemented several market-friendly structural reforms especially in the financial sector (Lee, 2012). This experience might have had a significant impact on households' behavior in Korea.

Therefore, the contribution of this paper relative to previous studies is not only to investigate whether the above adjustment process by Korean households is in line with previous findings in advanced economies but also to examine whether this behavior has changed since the Asian financial crisis. In addition, given the severity of the recent global financial crisis and the subsequent global slowdown, the results of the latter analysis may have particular implications for policymakers in other countries.

The remainder of this paper is organized as follows. Section 2 briefly discusses a theoretical rationale for a long-run relationship among those three variables. Section 3 provides data descriptions and their properties and, subsequently, presents the empirical methodology. Section 4 reports empirical findings and their economic implications and also examines the stability of the cointegrating vector, which is a fundamental assumption in cointegration analysis. Lastly, Section 5 presents our conclusions.

2. Theoretical framework

This section presents the theoretical rationale for the presence of a long-run relationship between consumption, financial wealth and human capital (or labor income).

Consider a representative consumer who faces an intertemporal budget constraint of (1), which shows how the available source for consumption evolves:

$$W_{t+1} = (1 + R^w_{t+1})(W_t - C_t) \tag{1}$$

where total wealth, W_t, is defined as the sum of observable tangible financial wealth and unobservable intangible human capital at the beginning of period t, R^w_{t+1} is the simple net return on aggregate wealth from t to $t+1$, and C_t is aggregate consumption. Note that all variables are denoted in real terms.[2]

Starting from (1), Campbell (1993) derives a useful expression of the log-linear consumption-wealth ratio of (2) using a first-order Taylor expansion:

$$c_t - w_t = E_t \sum_{j=1}^{\infty} \rho^j (r^w_{t+j} - \Delta c_{t+j}) + \frac{\rho\chi}{1-\rho} \tag{2}$$

where $c_t = \ln C_t$, $w_t = \ln W_t$, $r^w_{t+j} = \ln(1 + R^w_{t+j})$, χ is a constant, and ρ is the ratio of investment to total wealth in the steady state, i.e., $\rho = \frac{W-C}{W} < 1$.

This expression is a log-linear version of the infinite-horizon budget constraint (1). The implication of (2) is that a higher consumption-wealth ratio today will reduce wealth and thus future consumption possibilities unless it is offset by higher future rates of return on invested wealth. Thus, the aggregate consumption-wealth ratio is a function of expected future returns on a market portfolio and a forward-looking agent consumes today based on expected future returns conditioned on information set at time t.

However, a critical limitation of taking (2) into data is that human capital, and thus also total wealth and return on total wealth, is not observable. To make (2) operational, this paper employs a Lettau and Ludvigson's (2004) approximation.

First, w_t can be approximated as:

$$w_t \approx \omega a_t + (1-\omega) h_t \tag{3}$$

where a_t and h_t are logs of financial wealth and human capital, and ω is the average share of financial wealth in total wealth.

Second, we can also express r^w_{t+j} in (2) as:

$$r^w_{t+j} \approx \omega r^a_{t+j} + (1-\omega) r^h_{t+j} \tag{4}$$

where r^a_{t+j} and r^h_{t+j} are returns on financial wealth and human capital, respectively.

Third, plugging (3) and (4) into (2), and disregarding the unimportant constant yields the following equation:

$$c_t - \omega a_t - (1-\omega) h_t = E_t \sum_{j=1}^{\infty} \rho^j \left[\omega r^a_{t+j} + (1-\omega) r^h_{t+j} - \Delta c_{t+j} \right] \tag{5}$$

In the above equation, however, neither h_t nor r^h_{t+j} is still observable. To address this issue, Lettau and Ludvigson (2004) follow Campbell's (1996) idea that observable labor income can be considered as the dividend on human capital.[3] They show that unobservable human capital h_t can be captured by observable labor income:

$$h_t = \kappa + y_t + z_t \tag{6}$$

where κ is a constant, y_t is the log of labor income and z_t is a mean zero stationary process.

Last, replacing h_t in (5) by (6) and disregarding the unimportant constant yields the following expression:

$$c_t - \omega a_t - (1-\omega) y_t = E_t \sum_{j=1}^{\infty} \rho^j \left[\omega r^a_{t+j} + (1-\omega) r^h_{t+j} - \Delta c_{t+j} \right] + (1-\omega) z_t \tag{7}$$

where ω is the average share of financial wealth in total wealth ($= (A/W)$) and ρ is the average share of investment in total wealth ($= (W-C)/W$). In addition, r^a_{t+j} and r^h_{t+j} are the returns on financial wealth and human capital from period $t+j-1$ to period $t+j$, respectively. Again, z_t is a mean zero stationary process.[4]

The implication of (7) is that if returns and consumption growth on the right side of (7) are assumed to be stationary, c_t, a_t and y_t must be cointegrated in theory. Now (7) becomes a testable equation and it uniquely identifies what proportion of households' total wealth is held in the form of human capital.

3. Data and methodology

3.1. Data descriptions and vector error correction model (VECM)

This paper uses Korean data ranging from 1980:Q1 to 2011:Q3. These data are available from the Bank of Korea (BOK) and the

[2] Interestingly, labor income does not appear explicitly in the wealth accumulation Eq. (1) because the market value of tradable human capital is assumed to be included in total wealth.

[3] That is, they assume the existence of a stationary price-dividend ratio on human capital. In contrast, if returns are not time varying and income follows a random walk, we can show that income is a constant fraction of human capital.

[4] The detailed procedure is available upon request to the author.