МОДЕЛЮВАННЯ БІЗНЕС-ПРОЦЕСІВ В ЕКОНОМІЦІ

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Currency exchange forecasting as well as elaboration of e ffective financial models for exchange rate movements were a hot topic for researches. Their findings have necessary not only f or academia, but also for industry, such as hedge funds, mutual funds, investment banks, etc. However, we still do not have predictive financial model for correlation structure of bilateral exchange rates.

In international finance, t here is a large literature that studies asset pricing in integrated capital markets. One of them is a model developed by Lustig H., Roussanov N. a nd Verdelhan A. (2011). Using principal component analysis, they construct two candidate risk factors: the average currency excess return, and the difference between the return on the last portfolio and the one on the first portfolio. Moving to mathematical notation, they analyzed classical Euler equatio n $E_t[M_{t+1}Rx_{t+1}^j] = 0$ with respect to linear model of stochastic discount factor $M_{t+1} = 1 - b(\Phi_{t+1} - \mu_\Phi)$.

Recent paper by Verdelhan A. (2017) diversifies research about currency exchanges. Developing idea of Lustig et al. (2011), he found that dollar factor, along with carry factor, is crucial as a part of stochastic discount factor. He developed further model by Lustig et a l. in terms of global shocks. Now, stochastic discount factor becomes dependent on country-specific shock along with «at least» two global shocks. Verdelhan presents the next formulation of SDF:

$$-m_{i,t+1} = \alpha_i + \beta_i\sigma_{i,t}^2 + \tau_i\sigma_{w,t}^2 + \gamma_i\sigma_{i,t}u_{i,t+1} + \delta_i\sigma_{w,t}u_{w,t+1} + \vartheta_i\sigma_{i,t}u_{g,t+1} \quad (1)$$

where $u_{i,t+1}$ are country-specific shocks, and $u_{w,t+1}$ and $u_{g,t+1}$ are global shocks.

All these shocks are i.i.d. Gaussian, with zero mean and unit variance. The variance of SDF is time-varying, and follow autoregressive Gamma processes:

$$\sigma^2_{i,t+1} = \theta_i \sigma^2_{i,t} + v_{i,t+1} \tag{2}$$

$$\sigma^2_{w,t+1} = \theta_w \sigma^2_{w,t} + v_{w,t+1} \tag{3}$$

However, this model is also incomplete, leaving space for further research in terms of SDF factors and uncertainty impact on SDF.

In other paper, Menkoff L. et al. (2012) analyzed the relation between global foreign exchange (FX) volatility risk and the cross section of excess returns arising from popular strategies that borrow in low interest rate currencies and invest in high interest rate countries. In this paper, they developed another view of pricing kernel with respect to the market excess return and volatility innovations as risk factors:

$$m_{t+1} = 1 - b_1 r^e_{m,t+1} - b_2 \Delta V_{t+1} \tag{4}$$

where $r^e_{m,t+1}$ is the log market excess return and ΔV_{t+1} is the volatility of innovations.

Gabaix X. and Maggiori M. (2015) find that capital flows drive exchange rates by altering the balance sheets of financiers that bear the risks resulting from international imbalances in the demand for financial assets. According to their model, SDF has next form:

$$1 = E\left[\beta R \frac{U'_{1,C_{NT}}}{U'_{0,C_{NT}}}\right] = E\left[\beta R \frac{\left(\frac{\gamma_1}{C_{NT,1}}\right)}{\left(\frac{\gamma_0}{C_{NT,0}}\right)}\right] = \beta R \tag{5}$$

The key drivers here is $U'_{1,C_{NT}}$, which is the marginal utility at time t over the consumption of nontradables.

As we can see, still there is no general approach about what drives uncertainty in bilateral exchange rates. On my opinion, factors, that affect SDF for exchange rate movements, are determinants of macroeconomic situation in a specific country, such as GDP growth rate and expected inflation.

I develop a model of stochastic discount factor that considers shocks for GDP growth as well inflation expectations. Both factors are dependent on both global and national shocks:

$$\begin{aligned}-m_{i,t+1} = \alpha_i &+ \beta^i_{GDP} \sigma^2_{GDPB,i,t} + \tau^i_{inf} \sigma^2_{inf,i,t} + \gamma_i \sigma_{gdp,i,t} u_{gdp,i,t+1} \\ &+ \delta_i \sigma_{inf,i,t} u_{inf,i,t+1} + \vartheta_i \sigma_{gdp,i,t} u_{gdp,g,t+1} + \varphi_i \sigma_{inf,i,t} u_{inf,g,t+1}\end{aligned} \tag{6}$$

where $\sigma^2_{GDPB,i,t}$ is a variance of GDP growth rate for country i, $\sigma^2_{inf,i,t}$ – variance of inflation rate for country i. Also, I incorporate effects of both national ($u_{gdp,i,t+1}$,

$u_{inf,i,t+1}$) and global shock s ($u_{gdp,g,t+1}$, $u_{inf,g,t+1}$) for GDP growth rate and expected inflation respectively.

As well as in (2) and (3), I assume that all these shocks are i.i.d. Gaussian, with zero mean and unit variance.

Potential areas for further research are, but not limited with, impacts form liquidity, intermediaries' wealth, monetary policies, international trade, or international capital flows. The different potential sources and interpretations of those global shocks, as well as the underlying economic sources of the differences in country betas.

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ВПЛИВ КУЛЬТУРНИХ ОСОБЛИВОСТЕЙ КРАЇНИ НА МІЖНАРОДНІ ПЕРЕГОВОРИ

Універсальною цінністю, котра була створена одночасно з людством, спрямувала поведінку та культуру суспільства, його напрямок мислення є норми етики. Під час становлення сучасного глобалізованого світу саме вони є джерелом толерантності, взаєморозуміння людей, народів, і створення та дотримання традицій, а також отримання нової інформації та знань. Це все є важливим для розвитку економіки та добробуту в суспільстві взагалі. Що стосовно теми дослідження, то без дотримання правил етикету та знання культури, успішно вирішених питань не може існувати [1].