Gold, Platinum and Expected Stock Returns
by
Darien Huang

Discussion

Pierre Collin-Dufresne
SFI@EPFL

WFA - June 2015

- Summary
- Empirics
- Theory
- Questions
- Conclusion

Summary

- Identify new pricing factor: the ratio of Gold to Platinum prices (GP)
  - The level of GP predicts future stock returns (US and international) better than standard predictor variables such as PD, PE, CAY, TermPrem,. . . (except VRP).
  - Changes in GP price the Fama-French size and book to market portfolios
- Propose an equilibrium model to explain these findings
  - Barro-Rietz consumption disaster model with two-factor stochastic disaster intensity and Epstein-Zin utility with $EIS = 1$.
  - Aggregate stock of Gold and Platinum are cointegrated (exogenous) processes.
  - Gold and platinum consumption are driven by exogenous preference shocks which are functions of the default intensity.

$\rightarrow$ Simulations of the calibrated model generate similar findings as empirical results above.

Risk-Factor?

- Interesting study to learn about Gold and platinum prices:
  - Gold prices tend to Fall during recessions while lease rates increase!
  - Gold is admissible as collateral by Basel I,II, III, and CME and ICE (not Platinum).
- Impressive (robust) empirical findings, but why stop with one-factor model and size and book to market portfolios (how about Industry and momentum portfolios)?
- How does GP factor work if added to standard Fama-French-Carhart model?
- How much does GP beta-sorted stocks improve mean-variance efficient portfolio relative to that obtained by trading standard Fama-French portfolios?
- Is there something special about Gold (or Platinum) or does it work with other commodity spread portfolios, e.g., Gold-Copper or Platinum-Copper? (I think this is what the theory would suggest).
- Is Gold special? Point out that gold can serve as collateral, as one possible economic mechanism. How much is it actually used as such? Can that be the explanation?

The Model

- Model exogenous aggregate consumption process (C_t) subject to disaster (level) shocks with two factor CIR intensity process (λ_t, ξ_t).
- Assume Gold and Platinum consumption does not affect aggregate consumption:

$\Rightarrow$ standard pricing kernel (indep. of G & P supply shocks): $\pi_t = ExpAff(\log C_t, \lambda_t, \xi_t)$

- S, G and P prices obtained by discounting future exogenous "cash-flows":
  - Stock dividends specified as $D_t = C_t^{\phi}$.
  - Gold "dividends" specified as $Q_{g,t} = e^{a_1 + a_2 \lambda_t} (\frac{C_t}{G_t})^{\phi}$
  - Platinum "dividends" specified as $Q_{g,t} = e^{b_1 + b_2 \lambda_t} (\frac{C_t}{X_t})^{\phi}$

  where G_t, X_t are exogenous aggregate stock of Gold and Platinum.
- Why does the model work?
  - If consumption $\downarrow$ then Cash-flows $\downarrow$ and discount rate $\uparrow$, so all $(S, G, P) \downarrow$ in bad states.
  - If disaster intensity increases, then S drops due to discount rate effect.
  - Instead, G and P also experience "cash-flow" effect in bad states:
    - Since $a_2, b_2 > 0$ G and P drop by less than S (their cash-flows rise).
    - Since $a_2 > b_2$ G drops less than P (G has higher cash-flows than P).

Q? Why does GP ratio matter for cross-sectional pricing?

A! If $a_2 > b_2$ then GP ratio picks up (λ_t, ξ_t) because of different sensitivity of cash-flows to λ_t (via differences in "preference shocks").

Questions

- Model with seven state variables and 23 parameters. Perhaps not that suprising one can make it fit a few moments (if one is smart and knows how to play with cash-flow and discount rate effects!).
- What is the model not able to explain? What are the new unexpected predictions?
- What is special about Gold and Platinum? Where do the exogenously specified "dividends" come from? Where do dynamics of X_t, G_t come from?

→ Could link to the old literature on convenience yields and optimal extraction.

- What is the economics behind "preference shocks" and $a_2 > b_2 > 0$?
- In the model GP should not help once one controls for λ_t, ξ_t. So for example, using price/consumption ratio (with EIS$\neq 1$) or Price/dividend ratio or Stock volatility or Option prices, should work the same, no? (but that is not what you find empirically...)
- Can the model simulation replicate the fact that GP drives out other predictors such as PD, PE, CAY etc... and that it seems different from VRP (i.e., empirically you find that VRP captures short term and GP long-term predictability)?

Conclusion

- Interesting empirical evidence. Might be useful to write two separate papers to dig deeper in the predictability and cross-sectional empirical asset pricing tests.
- Is this a new risk-factor (does it really expand the mean-variance frontier) relative to existing factors we have?
- The theoretical model is a nice way to generate the findings based on some interestingy stylized facts (Gold and platinum prices drop in recession while lease rates go up)
- Would be interesting to push the model a bit more to see if it is really consistent with the empirics:
  - Does GP really drive out other risk-premium factors (PD, VRP) in model simulations?
  - Is the data consistent with the cash-flow differential story (i.e., are relative moves in the Gold vs. platinum convenience yields driving the GP predictability results)?
  - Would not using convenience yields themselves work as predictors in the model? what about in the data?
  - If plot the model simulated convenience yields, are they consistent with the data?
- Would be nice to have more economics for the "preference shocks" and G&P "cash-flows".