Title: A risk management approach toward the assessment of sustainable sovereign debt levels
Supervisor: Dennis Bams (w.bams@maastrichtuniversity.nl)
Short text: Subsequent to the Global Financial Crisis, many countries have seen their government debt levels increase substantially. From an economic stability perspective it is relevant to assess the sustainability of elevated debt levels. Large holders of sovereign bond portfolios such as pension funds are critically dependent on a proper risk assessment of sovereign bond risk.
IMF and the European Stability Board have developed a risk measuring system, in which specific indicators should remain within specific limits. In an ESM working paper by Gabriele et al, (ESM, 2017) entitled "Debt Stocks Meet Gross Financing Needs: A Flow Perspective into Sustainability", the authors pursue a statistical approach to define relevant explanatory variables for debt (un)sustainability.
The topic of this thesis proposal is to develop an economic foundation to support the assessment of sovereign debt sustainability. In particular, the Merton model uses the concept of a distance-to-default model in the context of company credit risk, making use of balance sheet information. This thesis topic seeks to adopt a Merton model a-like application for countries. In the empirical part of the thesis the model is to be empirically tested for a country of your choice.

Title: Household risk management
Supervisor: Dennis Bams (w.bams@maastrichtuniversity.nl)
Short text: Households are in different phases of their life exposed to different risk drivers with in potential major financial consequences. You may think for example of the impact of divorce, unemployment, death and disability on mortgage requirements as well as on adequate saving for the retirement period. Households may act in a suboptimal manner regarding important consumption decisions as well as with regards to financial planning decisions.
The aim of this thesis proposal is to apply a risk management framework such as the COSO framework to develop for households. Subsequently, the thesis should include a relevant simulation study for different type of households in different economic circumstances. In particular the simulation should put forward ways in which risk drivers lead to potential undesirable outcomes and suggest what tools households have at their disposal to manage these risks.

Title: Can tail risk and systemic risk of financial institutions be jointly reduced?
Supervisor: Stefan Straetmans (s.straetmans@maastrichtuniversity.nl)
Short text: Systemic risk is at the forefront of regulatory and policy discussions since the banking and financial crisis of 2007-2009. Post-crisis financial regulatory reform also claims to tackle systemic risk by e.g. targeting so-called "SIFI's" (Systemically Important Financial Institutions) by imposing additional capital surcharges. The purpose is to disincentivize financial institutions to being systemically important. Recent research, however, questions whether it is possible to both regulate tail risk of financial institutions and their systemic contribution, see e.g. Beale et al. (2011). More specifically, by diversifying their risks, financial institutions reduce their own probability of failure. However, if many banks decrease their risks in comparable fashion, then the likelihood of multiple failures (systemic risk) may increase. Whereas the Beale et al. (2001) paper mainly provides a theoretical analysis of this apparent trade off (and resulting policy dilemma), the aim of the current research project is to provide more empirical evidence by calculating different proxies of tail risk and systemic risk over time and for many different institutions and by investigating their correlation. Is there indeed a negative correlation visisble between popular measures of tail risk and systemic risk over time and across institutions?

References:
• Beale, N, Rand, D.G., Battey, H., Croxson, K, May, R.M., Nowak, M.A., 2011. Individual vs. Systemic risk and the Regulator Dilemma. Proceedings of the National Academy of Sciences of the United States (PNAS) 108 (31), 12647-12652.
• De Jonghe, O., 2010. Back to the basics in banking? A Micro-analysis of Banking System Stability. Journal of Financial Intermediation, 19, 387–417.
• Idier, J., Lame, G., Mésonnier, JS. 2014. How useful is the Marginal Expected Shortfall for the Measurement of Systemic Exposure? A practical assessment. Journal of Banking and Finance 47, 134–146.

Title: Finite endpoint distributions in economics and finance
Supervisor: Stefan Straetmans (s.straetmans@maastrichtuniversity.nl)
Short text: The boundedness of economic or financial variables is often open to discussion: is there a lower or upper bound and if so does it increase or decrease over time? For example, since the 1960s and the birth of the 'eco-movement' (even long before the discussions on the climate crisis even started), economists started to question the limits to (long run) growth and productivity given the limited resources of the earth. Are there boundaries to industrial output and productivity (probably yes) but (more importantly), how did these bounds change over time? Another example where boundedness plays a role is efficiency measurement (governmental institutions, banking sector etc). Do these institutions produce their goods and services at the lowest possible costs or are there 'inefficiencies' in the system? The estimation of finite endpoints provides an alternative methodology to measuring these inefficiencies within an institutional context. Yet another application could be in the domain of climate data: do temperature and weather distributions have finite endpoints and if so, does it shift rightward? Establishing this statistically may provide further empirical evidence for climate change.
References:
• Jesson J. Einmahl, John H. J. Einmahl & Laurens de Haan (2019) Limits to Human Life Span Through Extreme Value Theory, Journal of the American Statistical Association, 114:527, 1075-1080, DOI: 10.1080/01621459.2018.1537912
• Daouia, A., Florens, JP, Simar, L. (2010). Frontier estimation and extreme value theory. Bernouilli. 16(4), 1039–1063, DOI: 10.3150/10-BEJ256

Title: Interventions in Long-Term Decision Making and Pension Communication
Supervisor: Thomas Post (t.post@maastrichtuniversity.nl)
Short text: Starting Date: immediately
Recent evidence shows that the majority of Dutch pension plan participants is poorly informed about their employer-sponsored pensions. This is striking as information on (for example) prospective benefits is personally relevant (it provides the most significant stream of overall pension income) and benefits are expected to change (due to current reforms). Such is information is (according to standard theories of economic behavior) necessary to decide on potentially building up additional private savings. Moreover, the ignorance of most pension plan members is even more striking as receiving the information is fairly easy, that is, often just two mouse clicks away. This topic includes researching the relevant theories and testing various ways to manipulate pension communication in order to increase awareness (and potentially action) among pension plan members.
Note, this topic is very broad in terms of research angle, method, and data. Regarding research strategies, focus, and interventions it includes, for example:
- textual manipulation of messages
- website, visuals, and tool design
- communication channel (direct, via employer, …; online, offline, social media, …) and timing (life events) interventions
- emotional triggers
- design of default options and products

- as well as big data approaches (data and text mining).

Therefore, contact Dr. Thomas Post well in advance before the thesis skill period to discuss and narrow down a concrete topic.

Title: Heuristics and Financial Product Valuation
Supervisor: Thomas Post (t.post@maastrichtuniversity.nl)
Short text: Starting Date: immediately
It is well-known that the average investor or consumer of a financial products uses shortcuts and heuristics to make financial decisions. Often, those heuristics induce behavior that leads to financial mistakes and individual welfare losses. While many papers have looked at decision-making heuristics and biases already (hyperbolic discounting, overconfidence, trend extrapolation…) the current topic is about valuation heuristics. That is, given a certain financial product, what "back-of the-envelop" mathematical models do normal people apply when they try to value a financial product (e.g. an annuity) to get an idea about of the product is worth the price. The results of such a study are highly relevant as understanding decision making processes and valuation heuristics is key to design smart interventions to improve consumer financial decision making (and a test of an idea could be part of the thesis).
Literature, especially from the literature on mathematics education, will be provided as a jump off point.
Contact Dr. Thomas Post well in advance before the thesis skill period to discuss and narrow down the concrete topic and research design.

Title: Experience-Based Learning in Finance
Supervisor: Dr. Peiran Jiao (p.jiao@maastrichtuniversity.nl)
Short text: Personal experiences influence subsequent decisions. For instance, people who lived through negative events, such as economic downturns and financial crises, tend to make consumption and/or investment decisions consistent with either elevated risk aversion or pessimistic beliefs about future economic conditions (e.g. Malmendier and Nagel, 2011, Malmendier et al. 2011, Giannetti and Wang, 2016, Knüpfer et al., 2017). In particular, attaching too much weight on the payoff component in experience can lead to biases (Kaustia and Knüpfer, 2008, Choi et al., 2009), even when payoffs are just the result of luck (Anagol et al., 2015). Learning based on personal experiences can be either rational (improving investors' skills and reducing their biases) or irrational (naively repeating previously successful actions). Payoffs from personal experiences can influence subsequent preferences and/or beliefs (Jiao, 2017). This project will rely on a combination of theoretical, empirical and experimental approaches to investigate the effects of personal experiences and experienced payoffs in repeated decision-making under uncertainty with feedback. The hope is to also disentangle the preference- and belief-based channels of these potential effects, and to generate useful implications for marketing and financial decision-making.
References:
Anagol, S., Balasubramaniam, V., & Ramadorai, T. (2015). The Effects of Experience on Investor Behavior: Evidence from India's IPO Lotteries.
Choi, J. J., Laibson, D., Madrian, B. C., & Metrick, A. (2009). Reinforcement learning and savings behavior. *The Journal of finance*, *64*(6), 2515-2534.
Giannetti, M., & Wang, T. Y. (2016). Corporate scandals and household stock market participation. *The Journal of Finance*, *71*(6), 2591-2636.
Jiao, P. (2017). Payoff-Based Belief Distortion. Working Paper. Available on SSRN: https://ssrn.com/abstract=2964289
Kaustia, M., & Knüpfer, S. (2008). Do investors overweight personal experience? Evidence from IPO subscriptions. *The Journal of Finance*, *63*(6), 2679-2702.
Knüpfer, S., Rantapuska, E., & Sarvimäki, M. (2017). Formative experiences and portfolio choice: Evidence from the Finnish great depression. *The Journal of Finance*, *72*(1), 133-166.
Malmendier, U., & Nagel, S. (2011). Depression babies: do macroeconomic experiences

affect risk taking? *The Quarterly Journal of Economics*, *126*(1), 373-416.
Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies. *The Journal of finance*, *66*(5), 1687-1733.

Title: Towards an Automated Valuation Model (AVM) for the Dutch Residential Market
Supervisors: Nils Kok (n.kok@maastrichtuniversity.nl)
Short text: The notion of automated (predictive) valuation has taken a firm hold in the US residential real estate market. From Zillow to Opendoor, the market for automatically generated values, rather than manual assessments of value, allows for faster underwriting and better risk management. But of course, much depends on the quality of data, the extent of contextual data inputs, and the quality of the machine learning model. This thesis topic is for MSc students that have strong statistical skills and familiarity with predictive modeling algorithms (e.g. XGBoost). Some knowledge on GIS applications is useful.
Data Sources:
- NVM data
- CBS data

References and background reading:
Kok et al. (2017). Big data in real estate? From manual appraisal to automated valuation.
Requirements:
Understanding of machine-learning based predictive models.

Title: Moving to Productivity II
Supervisors: Nils Kok (n.kok@maastrichtuniversity.nl)
Short text: Real estate sustainability has mostly been framed in terms of energy efficiency, but has other dimension as well, such as occupant health and productivity. Maastricht University works together with the city of Venlo in a number of studies concerning the relationship between indoor climate and worker productivity. The first of these is entitled "Moving to Productivity", which involved an extensive survey among office workers in Venlo before and after they moved from a conventional office building to a building that was designed for an optimal indoor climate. All these four surveys took place before the Covid-19 crisis.
The idea for this thesis is to do a fifth survey that specifically compares the office work experience – using the data from the previous surveys – with the working-from-home experience. On top of that, we want to investigate sub-questions relating to the decision to come back to the office to work there (between June and September). The fifth survey will be based on the four previous ones, with some new questions added about the work environment as home. The survey infrastructure that we used before can be employed again for this study.
Data Sources:
- Gemeente Venlo

References and background reading:
Palacios et al. (2020). "Moving to productivity: The benefits of healthy buildings." PLOS One.
Requirements:
- Statistical proficiency, using R or Stata.
- Speaking Dutch is very useful.

Title: Explaining Air Quality: A Global Study
Supervisors: Nils Kok (n.kok@maastrichtuniversity.nl)
Short text: Air quality has emerged as a hot topic (literally) not just in emerging economies like India and China, but also in developed nations such as the UK, the

Netherlands, and the U.S. The air that we breath has implications for physical development and cognitive performance, and the body of evidence on this topic is increasing rapidly.
Most studies use satellite data to gain an understanding of local levels of air pollution, but such measures are not necessarily precise or accurate. Alternatively, most countries have local air quality measurement systems, but these are typically spread across large distances.
This thesis aims to use the data gathered by the network of installed sensors provided by PurpleAir, which has an "opt out" policy for each outdoor sensor that they sell to a customer (see the the PurpleAir website). With global data on air quality in hand, the question is what determines the cross-sectional variation in air quality, building a model that includes metrics such as local GDP, industry concentration, and urban development.
Data Sources:
- PurpleAir
- Local Census bureaus/agencies

References and background reading:
Air pollution lowers Chinese urbanites' expressed happiness on social media (link)
Real estate valuation and cross-boundary air pollution externalities: evidence from Chinese cities (link)
Self-protection investment exacerbates air pollution exposure inequality in urban China (link)
Requirements:
Statistical proficiency, using R or Stata.

Title: Income inequality
Supervisor: Robin Aarts (r.aarts@maastrichtuniversity.nl)
Short text: Reducing inequalities is a requirement for human rights and justice, and is essential for success in other global priority areas, such as environmental sustainability, conflict resolution and migration (UNESCO, 2016). Trends on inequality are not one-way; in recent years, some countries have succeeded in reducing or at least halting rising inequalities, but in some cases these trends are being reversed (Cornia and Martorano, 2012). Income inequality affects many other aspects in life, such as economic growth, nutrition and health, inequalities in voice and power, and the prevalence of conflict and political polarisation. In order to narrow down the research focus, students can choose one specific factor with which they want to link income inequality and analyse how that factor affects or is affected by income inequality. Students could first do a quantitative analysis with regression analyses for a certain geographical area, measuring the effect of income inequality on the factor of their choice or vice versa. They then can go more in depth with a qualitative design, such as a case study of one particular country, to investigate elements that might have an impact on this relation.

Title: (Female) Entrepreneurship in the FinTech era
Supervisor: Pomme Theunissen (p.theunissen@maastrichtuniversity.nl)
Short text: This thesis topic builds on the possibilities offered by FinTech and other new digital technologies as a contribution to (female) entrepreneurship research.
To entrepreneurs, access to finance is often the main hurdle that impedes the growth of their business (Block et al., 2018; Cumming et al., 2019) . In this thesis topic, the student is requested to investigate the potential opportunities and drawbacks offered by FinTech and other digital technologies in enhancing the access to finance, and the related impact on their business (Bollaert et al., 2021; Kavuri & Milne, 2019).
Digital technologies are recognized as disruptive (von Briel et al., 2018) and are an important source of transformation of the entrepreneurial environment (Bi et al., 2017; Giones & Brem, 2017). They therewith offer a broader set of opportunities particularly salient for start-ups and prospective entrepreneurs (Dholakia & Kshetri, 2004; Kolokas et al., 2020).
The scope of this topic may be aimed at startups and entrepreneurship in general;

Alternatively, the topic can focus on female entrepreneurship (Ughetto et al., 2019).

References:

Bi, R., Davison, R. M., & Smyrnios, K. X. (2017). E-business and fast growth SMEs. Small Business Economics, 48(3), 559–576.
Block, J. H., Colombo, M. G., Cumming, D. J., & Vismara, S. (2018). New players in entrepreneurial finance and why they are there. Small Business Economics, 50(2), 239–250.
Bollaert, H., de Silanes, F. L., & Schwienbacher, A. (2021). Fintech and access to finance. Journal of Corporate Finance, 101941.
Cumming, D., Deloof, M., Manigart, S., & Wright, M. (2019). New directions in entrepreneurial finance. Journal of Banking and Finance, 100, 252–260.
Dholakia, R. R., & Kshetri, N. (2004). Factors impacting the adoption of the Internet among SMEs. Small Business Economics, 23(4), 311–322.
Giones, F., & Brem, A. (2017). Digital technology entrepreneurship: A definition and research agenda. Technology Innovation Management Review, 7(5).
Kavuri, A. S., & Milne, A. (2019). FinTech and the future of financial services: What are the research gaps?
Kolokas, D., Vanacker, T., Veredas, D., & Zahra, S. A. (2020). Venture Capital, Credit, and FinTech Start-Up Formation: A Cross-Country Study. Entrepreneurship Theory and Practice.
Ughetto, E., Rossi, M., Audretsch, D., & Lehmann, E. E. (2019). Female entrepreneurship in the digital era. Small Business Economics.
von Briel, F., Davidsson, P., & Recker, J. (2018). Digital technologies as external enablers of new venture creation in the IT hardware sector. Entrepreneurship Theory and Practice, 42(1), 47–69.

Title: Media and the Stock Market

Supervisor: Dr. Peiran Jiao (p.jiao@maastrichtuniversity.nl)

Short text: Many papers suggest that market reactions to news in media can deviate from Bayesian prescriptions. For instance, investors are prone to react to “stale news” which merely repeat previous revelations (Tetlock, 2011), and to focus on “attention-grabbing” stocks in the media rather than considering all available information (Barber and Odean, 2008). More generally, sentiments in news and online searches predict stock returns and trading volumes (Tetlock, 2007), stocks with low coverage have higher returns (Fang and Peress, 2009). Beyond traditional news media, activity in specialist chat rooms (e.g. *RagingBull*) predicts high volatility and trading volume (Antweiler and Frank, 2004), and sentiment indicators extracted from online forums and searches can predict returns (Chen et al., 2014). A growing economic literature also compares online and offline news (Gentzkow, 2011). Open questions remain in this field regarding social media: How is social media content processed? Is it processed differently from traditional online and offline news? Which models best describe the role of information from different sources? This project relies on proprietary data of media content (quantity of coverage and sentiments) to analyse the differential impacts of social and traditional news media on financial markets.

References:

Antweiler, W., & Frank, M. Z. (2004). Is all that talk just noise? The information content of internet stock message boards. *The Journal of Finance*, *59*(3), 1259-1294.
Barber, B. M., & Odean, T. (2007). All that glitters: The effect of attention and news on the buying behavior of individual and institutional investors. *The Review of Financial Studies*, *21*(2), 785-818.
Chen, H., De, P., Hu, Y., & Hwang, B. H. (2014). Wisdom of crowds: The value of stock opinions transmitted through social media. *The Review of Financial Studies*, *27*(5), 1367-1403.
Fang, L., & Peress, J. (2009). Media coverage and the cross-section of stock returns. *The Journal of Finance*, *64*(5), 2023-2052.
Gentzkow, M., & Shapiro, J. M. (2011). Ideological segregation online and offline. *The Quarterly Journal of Economics*, *126*(4), 1799-1839.

Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. *The Journal of Finance*, *62*(3), 1139-1168.
Tetlock, P. C. (2011). All the news that's fit to reprint: Do investors react to stale information?. *The Review of Financial Studies*, *24*(5), 1481-1512.

Title: Impact of Covid-19 on Risk-Neutral Distributions
Supervisor: Paulo Rodrigues (p.rodrigues@maastrichtuniversity.nl)
Short text: The Coronavirus outbreak caused not only severe health problems but also major economic disruptions. Derivative markets allow us to estimate market implied expectations of the size of economic disruptions. One such paper that does this is "Coronavirus: Impact on Stock Prices and Growth Expectations". In this project you are asked to use the method proposed by Breeden and Litzenberger (1978) to get option implied estimations of risk-neutral distributions of major stock market indices on days before and after the implementations of lockdowns and stimulus packages. Students that want to take this topic are expected to have a basic knowledge of option pricing, be willing to do extensive data work, and be familiar with a programming language like, e.g., Matlab, R, Python.
References:
Douglas T. Breeden and Robert H. Litzenberger (1978): "Prices of State-Contingent Claims Implicit in Option Prices". The Journal of Business
Vol. 51, No. 4, pp. 621-651.
Niels Joachim Gormsen and Ralph S. J. Koijen (2020): "Coronavirus: Impact on Stock Prices and Growth Expectations". University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2020-22

Title: Predictive regressions and extreme signals (Asset pricing)
Supervisor: Stefan Straetmans (s.straetmans@maastrichtuniversity.nl)
Short text: The classic approach in asset pricing towards testing return predictability is to regress (excess) returns on past returns or other publically available information (financial or macroeconomic variables, see e.g. Goyal and Welch (2008) for predictors of stock returns). In this project we would like to investigate return predictability when predictors (i.e. the 'signal') take on extreme values (spikes). For example, in foreign exchange markets Purchasing Power Parity (PPP) and Uncovered Interest Parity (UIP) constitute cornerstones of short-run and long-run exchange rate determination. However, the empirical evidence on both conditions is relatively weak. There is some long-run evidence for relative PPP (regressing nominal bilateral exchange rate changes on inflation differentials for multiyear periods). But absolute and relative PPP are characterized by serious deviations (swings in the real exchange rate) when considering higher frequency data (the short run). Empirical evidence on UIP is also relatively weak: regressing nominal bilateral changes of the spot exchange rate on lagged cross-country interest differentials typically render a negative relation instead of the expected positive relation according to the theory. We would like to investigate the empirical validity of the parity conditions above when the inflation differential or interest differential is large in absolute value (extreme). Goods (interest) arbitrage might be more worthwhile to undertake when these cross country differentials are large.
The same question can be asked about other risky asset classes like stocks, bonds, housing etc. Do extreme swings in fundamentals transfer to returns? And if so, what does it imply for return predictability? Obviously, given that regressions are by definition average relations between dependent and independent variables, one needs to resort to other methodologies. In this project, one could focus on quantile regressions or tail dependence measures like the Marginal Expected Shortfall (MES) which has been widely used to measure systemic risk of financial institutions, see e.g. Brownlees and Engle
References:
• Brownlees, C.T., Engle R. , 2017. SRISK: A Conditional Capital Shortfall Measure of Systemic Risk. The Review of Financial Studies 30(1), 48-79.

• Cumparayot, P., de Vries, Casper G., 2017. Linking Large Currency Swings to Fundamentals' Shocks. Working paper.
• Hartmann P, Straetmans S, Vries CG de., 2004. Asset market linkages in crisis periods. Review of Economics and Statistics 86 (1):313-326.
• Welch, I., Goyal, A., 2008. A comprehensive look at the empirical performance of Equity Premium Prediction. The Review of Financial Studies 21(4), 1455-1508.

Title: Macro stress tests and disaster risk
Supervisor: Stefan Straetmans (s.straetmans@maastrichtuniversity.nl)
Short text: The aim of this project would be to assess the marginal and joint likelihood of sharp downfalls in macro variables. It is well known that financial returns and losses are nonnormally distributed. However, the frequency of sharp falls in macrovariables remains underinvestigated as to date. Very little empirical research has been done on the tail risk and the tail dependence of real variables, partly because the data frequency of these series is much lower. This implies that it is harder to make estimation and inference in the tails. This project aims to fill this gap by assessing the tail risk and the tail dependence (spillovers) of variables like GDP growth, changes in unemployment, inflation or money growth. A scant literature looks into volatility clustering of real variables (see e.g. Engle (1982)) which is a sufficient condition for the heavy tailness of the corresponding variables. Correctly assessing the marginal and joint (spillover) likelihood of extreme downfalls in macro variables may be relevant for e.g. the asset pricing or disaster risk literature, the literature on business cycle synchronisation or for stress testing.
References:
• Janssen, D., de Vries, C.G., 1991. On the frequency of large stock returns: putting booms and busts into perspective. Review of Economics and Statistics 73, 19-24.
• Engle, R.J., 1982. Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of UK Inflation, Econometrica, 50 (4), pp. 987-1007.
• R.J. Barro, 2006. Rare Disasters and Asset Markets in the Twentieth Century. 121(3), 823-866.

Title: Do inflation expectations respond to sentiment in central bank speeches
Supervisor: Dirk Broeders (d.broeders@maastrichtuniversity.nl)
Short text: The goal of this thesis is to empirically analyze how inflation expectations responds to speeches by members of the Governing Council and the ECB Board of Directors. Consensus inflation forecast can be used as well as market implied inflation expectations that can be derived from inflation linked bonds. You can also look at inflation linked swaps or inflation linked options although these two are traded only over-the-counter and data might not be easily accessible. The study uses Natural Language Processing (NLP) analysis. The ECB has published all speeches in an easy accessible csv format since the beginning of the ECB:
https://www.ecb.europa.eu/press/key/html/downloads.en.html.
References: Warin, T. and W. Sanger (2020), The speeches of the european central bank's presidents: An nlp study, Global Economy Journal, 20(2): 1-31.

Title: An empirical assessment of the relationship between the cost of equity and realized equity returns
Supervisor: Dennis Bams (w.bams@maastrichtuniversity.nl)
Short text: The Dividend Discount model, according to conventional finance theory, relates the present value of a company's equity to the discounted value of future dividend payments. The discount rate, or formally the cost of equity, represents a risk-adjustment of expected future dividends and it makes intuitive sense that the discount rate is positively related to expected future equity returns from a risk-return perspective. In this research topic we are interested in empirically assessing the relationship between the implied cost of equity and realized future returns by following the refined approach of estimating the cost of equity proposed by Hou et. al (2012), based on earlier approaches

introduced by Gordon and Gordon (1997) and Gebhardt et. al (2001). Data acquisition will be done using CRSP and Compustat. Main points of interest are the robustness of the Earnings forecasts to slight model adjustments, robustness of the cost of equity estimation to different Dividend Discount model assumptions and finally how the relationship between realized returns and cost of equity can be interpreted for different approaches for estimating the earnings forecasts, Dividend Discount model assumptions and return holding periods. Data acquisition will be done using CRSP and Compustat. Knowledge of Empirical or Mathematical Finance will help but is not a prerequisite.

References:

Hou, K., Van Dijk, M. A., & Zhang, Y. (2012). The implied cost of capital: A new approach. Journal of Accounting and Economics, 53(3), 504-526.

Gebhardt, W. R., Lee, C. M., & Swaminathan, B. (2001). Toward an implied cost of capital. Journal of Accounting Research, 39(1), 135-176.

Gordon, J. R., & Gordon, M. J. (1997). The finite horizon expected return model. Financial Analysts Journal, 53(3), 52-61.

Title: (Un)equal access to housing wealth

Supervisor: Jonas Wogh (j.wogh@maastrichtuniversity.nl)

Short text: Homeownership is the most important source of wealth accumulation for households. However, a growing body of evidence suggests that different groups of society earn different returns on their real estate, which leads to significant wealth gaps. The reasons for these disparities can be widespread, ranging from differences in bargaining skills over differences in location choice to outright discrimination.

In this project, you will investigate inequalities in real estate markets and their significance for wealth accumulation. This topic can be approached from many different angles and you will be given sufficient flexibility in choosing your preferred one.

References:

- Avenancio-Leon, C., & Howard, T. (2019). The assessment gap: Racial inequalities in property taxation. Available at SSRN 3465010.
- Goldsmith-Pinkham, P., & Shue, K. (2020). The gender gap in housing returns (No. w26914). National Bureau of Economic Research.
- Kermani, A., & Wong, F. (2021). Racial Disparities in Housing Returns (No. w29306). National Bureau of Economic Research.
- Bhutta, N., & Hizmo, A. (2021). Do minorities pay more for mortgages?. The Review of Financial Studies, 34(2), 763-789.

Title: House prices – fundamentals or bubble?

Supervisor: Jonas Wogh (j.wogh@maastrichtuniversity.nl)

Short text: The development of residential real estate prices – especially their rapid increase in some urban markets – has been far up on the political agenda in recent years. It has also evoked bleak memories from the run-up to the global financial crisis, which was preceded by rapidly surging house prices. This raises the important question of whether the current trend reflects another (credit-driven) bubble or whether it is instead driven by economic fundamentals, such as geographic supply constraints or growing labour demand in urban regions.

In this project, you will begin by reviewing the literature on house price fundamentals and their historic importance. Then, you will engage in an empirical analysis of median house prices in different regional (sub-)markets, in order to identify whether unequal trends can be explained by certain economic fundamentals.

References:

- Saiz, A. (2010). The geographic determinants of housing supply. The Quarterly Journal of Economics, 125(3), 1253-1296.

- Chodorow-Reich, G., Guren, A. M., & McQuade, T. J. (2021). The 2000s housing cycle with 2020 hindsight: A neo-kindlebergerian view (No. w29140). National Bureau of Economic Research.

• Favara, G., & Imbs, J. (2015). Credit supply and the price of housing. American Economic Review, 105(3), 958-92.
• Black, A., Fraser, P., & Hoesli, M. (2006). House prices, fundamentals and bubbles. Journal of Business Finance & Accounting, 33(9-10), 1535-1555.

Title: Does Culture Affect Outcomes in Finance and Banking?
Supervisor: Stefanie Kleimeier (s.kleimeier@maastrichtuniversity.nl)
Short text: Today, societies, markets and companies are faced with globalization through the increasing interdependence between countries, economies and peoples. Regarding the consequences of this globalization process, proponents of convergence theory argue that globalization will lead to homogenization in individual decision-making and to transnational standardization of markets and economies. In contrast, proponents of divergence theory argue that regional differences have their roots in national culture, which has allowed these differences to persist over a long period of time and may continue to exist in the future despite the pressures of globalization. Thus, the theory of divergence predicts that economic, financial or business-related characteristics should continue to vary widely across countries even in a globalized economy, and that cultural characteristics can explain these unique national characteristics.

Guiso et al. (2006) describe the research area of "cultural economics" from the premise that for individuals - through religion or ethnicity - culture is largely a "given" and not easily changed. Culture, in turn, influences economic decision-making. For example: In cultures with high levels of trust, banks may be less likely to require collateral or guarantees from borrowers because they have confidence in the borrower's intention to repay the loan. Cross-border mergers may be more successful if the managers of the different business units are accustomed to the same corporate culture regarding power and hierarchy in management decision-making. Investors may have a strong preference for domestic stock and bond portfolios if they feel culturally very different from the foreign markets in which they might invest.

Reuter (2011) and Karolyi (2016) discuss different approaches to measuring culture and provide an overview of different areas of research. Their studies show that a wide variety of analysis is possible on this topic and that many questions remain unanswered. In a thesis, students can examine the impact of culture at different levels, ranging from (1) manager/investor decision-level analyses, (2) firm-level analyses, to (3) country-level analyses. Here are some examples of cultural studies in finance: Heuchemer et al. (2009) and Sander et al. (2016) are examples of country studies that show how cultural differences between countries affect cross-border banking. Note that the data used in these two studies are now publicly available in Table 6.2 of the BIS Locational Banking Statistics and may well be used by students in their own graduate research. - Costa et al. (2013) is an example of a country-level analysis and illustrates how national culture affects the underpricing of IPOs. An example of a short country-level article that relates national culture to stock market returns at the beginning of COVID-19 pandemic is Ashraf (2021). - Orij (2010), Holderness (2016), and Díez-Esteban et al. (2019) and Choi (2020) are examples of firm-level analyses and illustrate how national culture affects the level of social disclosure, ownership structures, dividend payments, corporate risk-taking, and research and development (R&D) investment, respectively. Kleimeier and Chaudhry (2015) explore how cultural difference between borrower and lender affect a firm's lending relationship with its bank (The LPC Dealscan database of bank loans is now available at UB via WRDS).
Note that the aforementioned study by Holderness (2016) was published in a special issue of the Journal of Corporate Finance on the link between culture and finance. More related studies can be found in this special issue. It should also be noted that the Journal of Banking and Finance has published numerous articles on national culture and financial decision-making of investors, banks and corporations over the past few years. Go to https://www.sciencedirect.com/journal/journal-of-banking-and-finance and search "national culture" or simply "culture." For example, articles link national culture to trading

in financial markets (Tan et al, 2019), firms' capital structure (Ghoul et al, 2019), their cost of debt capital (Chui et al, 2016), the maturity of debt capital (Zheng et al, 2012), cash holdings (Chen et al, 2015), or the degree of IPO underpricing (Kanagaretnam et al., 2022).

Please note that during the last couple of years, several SBE students have investigated this topic with specific focus on the effect of cultural differences on the performance of cross-border M&A. Thus, new thesis proposals on this specific sub-topic will not be accepted.

Sources for national-level cultural data:
Hofstede's Cultural Dimensions: https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ or http://globe.bus.sfu.ca/
World Value Survey: www.worldvaluessurvey.org
European Values Study: https://europeanvaluesstudy.eu/
European Social Survey: http://www.europeansocialsurvey.org/

Sources for cross-border banking data at the national level:
BIS Locational Banking Statistics, Table 6.2:
https://www.bis.org/statistics/bankstats.htm?m=6%7C31%7C69

Analytical methods:
In terms of methods and techniques, this track lends itself to empirical quantitative analysis, i.e. analysis of international samples using regression methods using existing data files / databases. The articles cited can serve as examples for structuring empirical analyses. Alternatively, students can select an existing empirical article using a national sample and replicate it for an international sample as part of their thesis research, focusing - in a regression analysis - on the main economic determinant, national culture and the interaction effect between this main economic determinant and national culture. In this way, observed differences between countries can be explained by cultural differences.
Given the impact the COVID-19 pandemic had on societies, economies and firms, it could also be interesting to examine, in an international sample spanning several years, whether the influence of culture on financial decision-making changed during the pandemic compared to before. A regression analysis could focus on national culture, the pandemic period and the interaction effect between the two. The interaction effect will indicate whether and how the effect of culture changed during the pandemic.
Literature:
Ashraf, B. N. (2021). Stock markets’ reaction to Covid-19: Moderating role of national culture. Finance Research Letters, 41, 101857.
Chang, M., Chang, B., & Dutta, S. (2020). National culture, firm characteristics, and dividend policy. Emerging Markets Finance and Trade, 56(1), 149-163.
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Chui, A. C., Kwok, C. C., & Zhou, G. S. (2016). National culture and the cost of debt. Journal of Banking & Finance, 69, 1-19.
Costa, B. A., Crawford, A., & Jakob, K. (2013). Does culture influence IPO underpricing?. Journal of Multinational Financial Management, 23(1), 113-123.
Díez-Esteban, J. M., Farinha, J. B., & García-Gómez, C. D. (2019). How does national culture affect corporate risk-taking?. Eurasian Business Review, 9(1), 49-68.
El Ghoul, S., Guedhami, O., Kwok, C. C., & Zheng, Y. (2019). Collectivism and the costs of high leverage. Journal of Banking & Finance, 106, 227-245.
Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes?. Journal of Economic Perspectives, 20(2), 23-48.
Heuchemer, S., Kleimeier, S., & Sander, H. (2009). The determinants of cross-border

lending in the Euro Zone, Comparative Economic Studies, 51(4), 467-499.
Holderness, C. G. (2017). Culture and the ownership concentration of public corporations around the world. Journal of Corporate Finance, 44, 469-486.
Kanagaretnam, K., Lee, J., Lim, C. Y., & Lobo, G. J. (2022). Trusting the stock market: Further evidence from IPOs around the world. Journal of Banking & Finance, 142, 106557.
Karolyi, G. A. (2016). The gravity of culture for finance. Journal of Corporate Finance 41, 610-625. Opening Article to Special Issue on Culture and Finance.
Kleimeier, S., & Chaudhry, S. (2015), Cultural distance and the structure of loan syndicates, Finance Research Letters, 15, 115-124.
Orij, R. (2010). Corporate social disclosures in the context of national cultures and stakeholder theory. Accounting, Auditing & Accountability Journal, 23(7), 868-889.
Reuter, C. H. (2011). A survey of 'culture and finance'. Finance, 32(1), 75-152.
Sander, H., Kleimeier, S., & Heuchemer, S. (2016). The resurgence of cultural borders during the financial crisis: The changing geography of Eurozone cross-border depositing. Journal of Financial Stability, 24, 12-26.
Tan, G., Cheong, C. S., & Zurbruegg, R. (2019). National culture and individual trading behavior. Journal of Banking & Finance, 106, 357-370.
Zheng, X., El Ghoul, S., Guedhami, O., & Kwok, C. C. (2012). National culture and corporate debt maturity. Journal of Banking & Finance, 36(2), 468-488.

Title: (Cost)Efficiency of Public Institutions
Supervisor: **Deborah Kaut** (deborah.kaut@maastrichtuniversity.nl)
Short text: Public institutions play a critical role in delivering services to society, yet their efficiency is often a subject of debate. Traditional measures of efficiency, such as cost per service unit, may not adequately capture the complexity of public services. In your study, you could explore advanced efficiency analysis methods, such as Data Envelopment Analysis (DEA) or Stochastic Frontier Analysis (SFA), to evaluate the performance of public institutions. You may choose to focus on sectors such as healthcare, education, or judicial systems. How has the (cost)efficiency of these institutions evolved over time, especially in the face of crises like COVID-19? You can also examine how institutional reforms and policy changes have impacted efficiency, how ressources should be allocated or whether previous benchmarking studies have missed an important aspect in their efficiency analysis.
References: Bogetoft, P. and Otto, L. (2011). Benchmarking with dea, sfa, and r. International Series in Operations Research &Amp; Management Science. https://doi.org/10.1007/978-1-4419-7961-2

Title: Do financial experts think about the pricing of marketing capabilities?
Supervisor: Daniele Ripani (daniele.ripani@maastrichtuniversity.nl)
Short text: There is an ongoing discussion in practice about whether investments in intangible assets are properly reflected in financial markets (The Economist, 2017). Among them, marketing capabilities account for a large chunk of a firm's intangible expertise. On the one hand, the higher financial performance of marketing capabilities has long been recognized (Dutta et al, 1999). However, do financial experts recognize it? Recently, research shows that "investors underreact to the value-relevant, but difficult to process, information embedded in marketing capability" (Ang, et al. 2022, *abstract*). Additional evidence is needed to understand the mechanism driving this result. The goal of this thesis is to develop a first approach in trying to understand if and how financial experts think about the pricing of marketing capabilities from a behavioural point of view.
References
Ang, T. C., Chordia, T., Mai, V. V. A., & Singh, H. (2022). The marketing capability premium. *Review of Asset Pricing Studies, 12*(4), 918-959.
Dutta, S., Narasimhan, O., & Rajiv, S. (1999). Success in high-technology markets: Is marketing capability critical? *Marketing science, 18*(4), 547-568.
The Economist (2017). Intangible assets are changing investment. *The Economist*. https://www.economist.com/finance-and-economics/2017/12/19/intangible-assets-are-

changing-investment

Title: Perceived marketing capability
Supervisor: Daniele Ripani (daniele.ripani@maastrichtuniversity.nl)
Short text: Much of the empirical work in the marketing-finance interface has focused on assessing the contribution of marketing efforts to financial performance via balance sheet data (Mishra et al. 2016, Moon et al. 2023). However, less research focuses on the effect of perceived marketing capabilities on the ability of a firm to increase pricing power without losing revenues. Are marketing capabilities only "on the books" or do clients/buyers take them into account also during their buying process? The goal of this thesis is to develop a first step in assessing the strength of perceived marketing capabilities on stakeholder's decision making and bridge the managerial marketing finance gap by drawing from new functional fields (marketing, behavioural finance, …) (Burggraeve, 2021).
References
Burggraeve, C. (2021), Marketing IS NOT a Black Hole.
Mishra, S., & Modi, S. B. (2016). Corporate social responsibility and shareholder wealth: The
role of marketing capability. *Journal of Marketing, 80*(1), 26-46.
Moon, S., Tuli, K. R., & Mukherjee, A. (2023). Does disclosure of advertising spending help investors and analysts? *Journal of Marketing, 87*(3), 359-382.

Title: Analyzing Financial Market Reactions to Management's Earnings Call Language on Marketing and R&D Discourse
Supervisor: Daniele Maria Ripani (daniele.ripani@maastrichtuniversity.nl)
Short text: Research shows that "investors underreact to the value-relevant, but difficult to process, information embedded in marketing capability" (Ang, et al. 2022, abstract). However, the role of Top Management Teams' communication of these marketing capabilities remains unclear. This thesis aims to analyze the language employed by Top Management Teams' during earnings calls, with a specific focus on the emphasis placed on marketing and earnings. The study seeks to investigate the impact of this communication on financial markets. Specifically, it explores whether and to what extent investors capture the communicated aspects of marketing and R&D.
References:
Ang, T. C., Chordia, T., Mai, V. V. A., & Singh, H. (2022). The marketing capability premium. Review of Asset Pricing Studies, 12(4), 918-959.
Martin, A., & Kushwaha, T. (2024). Can words speak louder than actions? Using top management teams' language to predict myopic marketing spending. Journal of Marketing, 88(6), 140-161.

Title: What is the relationship between trust and trade within the context of Networks?
Supervisor: Florens Pfann (florens.pfann@maastrichtuniversity.nl)
Short text: According to Arrow (1974), there can be no trade without trust. Yet what circumstances determine whether the ability to trust or the attribute of trustworthiness is vital? The aim of your thesis is to analyse how `perceived' trustworthiness and the ability to trust are affected by their surroundings. For example, does the eurozone or European Union membership affect willingness to trade and if so, what is a potential mechanism?
References:
-Arrow, K. J. (1974). The limits of organization. WW Norton & Company.
-Cook, K. S., Levi, M., & Hardin, R. (Eds.). (2009). Whom can we trust?: How groups, networks, and institutions make trust possible. Russell Sage Foundation.
-Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018). Global evidence on economic preferences. Quarterly Journal of Economics, 133 (4), 1645–1692.
-Nitsch, V. (2000). National borders and international trade: evidence from the European Union. Canadian Journal of Economics/Revue canadienne d'économique, 33(4), 1091-

1105.

Titel: De invloed van Verenigingen van Eigenaren (VvE's) op energielabels en verduurzaming
Supervisor: Piet Eichholtz (p.eichholtz@maastrichtuniversity.nl)
Korte tekst: Circa 13% (300.000 woningen) van het bezit van woningcorporaties is onderdeel van een VvE. In de transitie naar een duurzamere gebouwde omgeving en het wel of niet halen van landelijke doelstellingen spelen Verenigingen van Eigenaren (VvE's) een cruciale rol. VvE-constructies zorgen namelijk voor een hapering in de verduurzaming van het vastgoed. Dit heeft te maken met de vereisten voor instemming van de woningeigenaren, huurders en de moeizame samenwerking onderling. Maar welke rol spelen de individuele belemmeringen bij de moeizame verduurzaming van VvE's? Welke effecten heeft dit op de energietransitie van de corporatiesector? En in hoeverre wordt in dit VvE-segment van de corporatievoorraad toegewerkt naar het uitsluiten van EFG-labels in het bezit na 2028?
Dit onderzoek richt zich op de vraag in hoeverre het bestaan van VvE's invloed heeft op de verduurzaming van gebouwen en welke factoren renovatie- en energielabelverbeteringen bepalen. Hierbij wordt gebruik gemaakt van data van de Autoriteit woningcorporaties (exclusief beschikbaar voor deze scriptie) om de kans op energielabelstappen bij VvE-constructies ten opzichte van niet-VvE-constructies in beeld te brengen. De impact van deze scriptie zit hem in het kwantificeren van de omvang van een maatschappelijk probleem (achterblijvende verduurzaming van VvE's) dat meer politieke aandacht verdient.
Mogelijke onderzoeksvragen
- VvE's en renovatiekansen: heeft het bestaan van een VvE invloed op de kans dat een gebouw wordt gerenoveerd en een beter energielabel krijgt?
- Dominantie van woningcorporaties: hoe verandert de invloed van woningcorporaties binnen VvE's over de tijd, en welke impact heeft dit op renovatiebeslissingen?
- Verklarende factoren: welke factoren, zoals VvE-structuur, eigendomsverdeling en regio, verklaren de renovatiegraad in een bepaald jaar?
- Corporaties en verduurzaming: in welke mate dragen woningcorporaties bij aan de verduurzaming van woningen binnen VvE's, en wat belemmert hen hierin?

Methodologie
Dit onderzoek maakt gebruik van analyses om de invloed van VvE's op renovaties en energielabelstappen te onderzoeken, met data over tijd en regio's. Daarnaast is ook het houden van interviews met bijvoorbeeld voorzitters van VvE's een mogelijkheid om de context en moeilijkheden bloot te leggen.
Relevantie
Dit onderzoek vult een gat in de academische literatuur door de invloed van VvE's op verduurzaming te analyseren, met belangrijke implicaties voor duurzaam vastgoedbeheer en beleidsvorming. Daarnaast zijn deze VvE-constructies niet alleen in Nederland een bekend fenomeen, maar zijn de implicaties van dit onderzoek ook relevant buiten Nederland. De resultaten kunnen beleidsmakers en woningcorporaties helpen om belemmeringen bij verduurzaming in VvE's weg te nemen en de samenwerking binnen VvE's te verbeteren.
Data
- Dataset van de Autoriteit woningcorporaties (Aw) met daarin vastgoedkenmerken, energielabels en VvE-informatie, exclusief beschikbaar gesteld voor de scriptie.

Title: Sustainability Preferences of Retail Investors
Supervisor: Peiran Jiao (p.jiao@maastrichtuniversity.nl)
Short text: Trillions of dollars flow into socially responsible investments (SRIs), yet it is unclear how investors trade off sustainability with financial performance, and what truly drives SRI choices. EU and other regulations increasingly require pension funds, mutual funds, banks and other financial institutions to evaluate their clients' sustainability preference, in order to design products in line with their demand. The literature so far has

no agreement on how this can be done. Sustainability preferences can reflect numerous aspects of the investors, such as their social preference, norm-following propensity, expectations about financial performance, etc. Therefore, it is imperative to look into the drivers of sustainability preferences and how they can be measured in practice.

References:

Bauer, R., Dong, B., & Jiao, P. (2024). Sustainability Preferences: The Role of Beliefs. Available at SSRN 4889330.

Hartzmark, S. M., & Sussman, A. B. (2019). Do investors value sustainability? A natural experiment examining ranking and fund flows. The Journal of Finance, 74(6), 2789-2837.

Heeb, F., Kölbel, J. F., Paetzold, F., & Zeisberger, S. (2023). Do investors care about impact?. The Review of Financial Studies, 36(5), 1737-1787.

Riedl, A., & Smeets, P. (2017). Why do investors hold socially responsible mutual funds?. The Journal of Finance, 72(6), 2505-2550.

Title: Are Sustainable Consumers Also Sustainable Investors?

Supervisor: Hongqing Zhang (hongqing.zhang@maastrichtuniversity.nl)

Short text: In recent years, an increasing number of people choose for sustainable living, leading to a higher demand for sustainable products such as recycled-material clothing and electric vehicles. As demand for these goods rises, their prices tend to increase. Consequently, companies that produce sustainable products experience higher revenue, yet they also face lower expected returns. We thus wonder : Do people still invest in the sustainable companies if they already bought sustainable goods? Moral licensing is introduced to explain.

Reference:

https://doi.org/10.1017/S0266267113000199.

https://ssrn.com/abstract=4098124 or http://dx.doi.org/10.2139/ssrn.4098124

Title: Profitable trading strategies using statistical learning algorithms

Supervisor: Peter Schotman (p.schotman@maastrichtuniversity.nl)

Short text: Once asset pricing and portfolio selection were simple. An optimal portfolio was a combination of the riskfree asset and the market portfolio, and its risk and expected returns were given by the CAPM beta. Nowadays hundreds of profitable trading strategies have been discovered that appear to outperform the market. With the advance of sophisticated statistical learning algorithms the pace of new discoveries increases. Many strategies share common characteristics. Therefore investors have become interested in summarising the multitude of trading strategies in a few factors. Constructing factors has also benefited from learning techniques. Seeking exposure to particular factors is called factor investing. Many promising trading strategies fail to deliver, however, after being discovered. This could be because many investors implement the strategy, and thereby arbitrage it away,

or because the strategy was a statistical illusion from the start. The latter are called false discoveries.

These are three areas for thesis topics: (i) prediction methods for returns, (ii) factor portfolio construction, (iii) performance evaluation. Each offers many opportunities for a thesis. Both the academic as well as the practitioner literature has abundant suggestions for new techniques and new promising strategies. This a very broad thesis topic, for which yiu need your own creativity to come up with a propoer research question. For a finance thesis, the emphasis must be on the finance application, not on mathematical or statistical proofs. How useful are techniques for finance? Two things are important for a feasible project. First, it must be possible to obtain the

necessary data. Through the library the school has access to many databases. In addition the Ken French Data Library is a rich, freely available, online database on asset returns. Second. working with statistical learning techniques requires some programming skills. Most methods are available as packages in the statistical language R (or Python). When packages are available, you don’t need to program the algorithms, but you must be able to use the packages. Relying solely on Excel will not be sufficient.

Literature: Below are a few suggestions to start reading.
Gu, S., B. Kelly and D. Xiu (2020) Empirical Asset Pricing via Machine Learning, Review of Financial Studies 33, 2223-2273.
Harvey, C. R., (2017) The Scientific Outlook in Financial Economics, Journal of Finance 72, 1399-1440.
Hodges, P.H., K.E. Hogan, J.R. Peterson and A. Ang (2017) Factor Timing with Cross-Sectional and Time-Series Predictors, Journal of Portfolio Management Fall 2017, 30-43

Title: Data based portfolio construction
Supervisor: Peter Schotman (p.schotman@maastrichtuniversity.nl)
Short text: The textbook recommendation for portfolio construction is mean-variance analysis. Since Markowitz the idea is to find a portfolio that obtains the highest expected return for a given variance. In practice this is far from trivial because mean-variance analysis requires accurate inputs for expected returns and covariances. Many studies show that naïve portfolio strategies almost always beat sophisticated optimised strategies. A famous classic study is DeMiguel, Garlappi and Uppal (2009) who find nothing can beat "1/N", which is a strategy that put equal weights in all available assets. Various solutions have been propsoed, either by restricting portfolio weights (Jagannathan and Ma, 2003) or by structuring investment beleifs (Black and Litterman, 1992). More recently, advances in data analytics, suggest a different solution (for example Pedersen, Babu Levine, 2021). In some of our own recent work, Lönn and Schotman (2024) explore a very simple algorithm for a different purpose but possibly also effective for portfolio construction. Further empirical evidence from a thesis study would be very helpful.
Literature:
Black, F. and Litterman (1992) Global Portfolio Optimization, Financial Analysts Journal 48, 28–43.
DeMiguel, Victor, Lorenzo Garlappi and Raman Uppal (2009) Optimal Versus Naive Diversification: How Inefficient is the 1/N Portfolio Strategy?, Review of Financial Studies 22, 1915–1953.
Lönn, Rasmus, and Peter Schotman (2024) Empirical Asset Pricing with Many Test Assets, Journal of Financial Econometrics, https://academic.oup.com/jfec/advance-article/doi/10.1093/jjfinec/nbae002/7630144.
Pedersen, L., A. Babu, and A. Levine (2021) Enhanced Portfolio Optimization, Financial Analysts Journal 77, 124–151.

Title: What failure to remember? What failure to forget?
Supervisor: Hongqing Zhang (hongqing.zhang@maastrichtuniversity.nl)
Short text: Much discussion about memory in psychology has been given. It is rather new in economics and finance study. In this project, specifically for financial investment failure, we question what memory is remembered clearly, what memory is not? There are four hypothesised mechanisms: First, people (do not) remember failure because they have (low) high disutility from self-deception. For example, the guilty that one deceives himself; Second, people (do not) remember inspiring and informative failure because they (cannot) can learn something from it. For example, one clearly remembers the loss he had in a financial crisis and try to avoid the mistake he made in next investment; Third, people (do not) remember failure because they (do not) feel shame after a peer-comparison. Motivated reasoning can be introduced to explain.
Reference:
https://www.journals.uchicago.edu/doi/full/10.1086/709971
https://www.mdpi.com/2073-4336/14/1/15
https://www.aeaweb.org/articles?id=10.1257%2Fjep.30.3.133&ref=quillette.com

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Title: Risk Attitude towards Sustainable Investing
Supervisor: Hongqing Zhang (hongqing.zhang@maastrichtuniversity.nl)
Short text: People usually hold different risk attitudes towards different economic

domains. When making traditional investment, people are risk-averse and profit chasing; When comes to sustainable investment, people seems to accept the low expected-return and hold a relevantly risk-taking attitude. Can domain-specific risk attitude explain such phenomenon?
References:
https://onlinelibrary.wiley.com/doi/abs/10.1002/bdm.414
https://www.tandfonline.com/doi/full/10.1080/20430795.2019.1608709

Title: Climate Transition Risk in Financial Markets
Supervisor: Juan Palacios (juan.palacios@maastrichtuniversity.nl)
Short text: The financial sector is facing growing concerns about the risks associated with the transition to a low-carbon economy, driven by the need to mitigate greenhouse gas emissions and address climate change. Following the Paris Agreement, an increasing number of countries have implemented carbon taxes and other regulatory measures to limit emissions from firms and households.
This research project will utilize a comprehensive dataset of local regulations within the US to develop measures of regulatory risk linked to climate transition. The student will explore the financial consequences of these risks on asset valuation and market dynamics, providing insights into how evolving climate policies are reshaping the financial landscape and exposing assets to the risk of becoming stranded.
Sources:
Bolton, P., & Kacperczyk, M. (2023). Global pricing of carbon-transition risk. The Journal of Finance, 78(6), 3677-3754.
Kroft, B., Palacios, J., Rigobon, R., & Zheng, S. (2024). Timing sustainable engagement in real asset investments (No. w32646). National Bureau of Economic Research.

Title: Climate risk and financial instability
Supervisor: Stefan Straetmans (s.straetmans@maastrichtuniversity.nl)
Short text: Climate change may impact the financial health of corporations (both in terms of physical risk but also transitional risk related to climate change). More specifically, for the banking sector, this has become an important attention point for Central Banks. In this project, we would mainly focus on the physical risk of climate change and how this potentially impacts the stability of the financial system. Is there a link between extreme weather data (temperature, precipitation etc) and large fluctuations in stock prices for financial institutions (banks, insurance companies)? The focus in this research can e.g. lie on the impact of extreme weather data on tail risk of individual institutions as well as systemic risk measures.
References:
"Tail Risk and Systemic Risk for U.S. and Eurozone Financial Institutions in the wake of the Global Financial Crisis", with Sajid Chaudhry, the Journal of International Money and Finance, 58, 191-223, 2015.
Hartmann P, Straetmans S, Vries CG de., 2004. Asset market linkages in crisis periods. Review of Economics and Statistics 86 (1):313-326.

Title: Biodiversity in the Real Estate Sector (3 topics)
Supervisor: Nils Kok (n.kok@maastrichtuniversity.nl)
Short Text: Category: Real Estate, Finance, Biodiversity, GIS
Biodiversity is rapidly growing in importance, with (European) regulation, such as the TNFD, as a prime driver. For investors, biodiversity is hard to grasp. Is this about wildlife? About land use? That has not reduced interest from investors though: ABP, one of the world's largest investors, has recently announced that it will allocate €1 billion to investment in biodiversity.

The finance literature is also getting to grips with this new topic. Some paper focus on the macro perspective, including the stock market, while others focus on impact of biodiversity at the local level. (There is more literature out there, check out NBER and Google Scholar.)

For real estate, biodiversity is a critical issue, given the land use of real estate developments. Often, this is in urban areas, but greenfield development is used often for commercial real estate developments, such as logistics and data centers. Some "green" rating systems, such as LEED, are actively encouraging developers to consider biodiversity loss (see for example, this LEED credit). However, new developments by default take land away from nature.

The first thesis topic explores the issue of biodiversity in real estate, using the LEED database, across space and over time, combined with GIS data layers on land use. The main question is how real estate developers have incorporated biodiversity protection measures over time, and how the intensity of those measures varies across jurisdictions. The student will work extensively with QGIS or ArcGIS.

In a second topic, biodiversity credits in the LEED database are related to financial performance of commercial real estate, using the CoStar database. (Akin to Eichholtz, Kok and Quigley, 2010, and many other similar papers.) Do tenants and investors care about biodiversity, is this priced in at all? In a possible extension, the LEED database can be related to the TREPP database, to understand the cost of debt as it relates to biodiversity (see Eichholtz, Holtermans, Kok and Yonder, 2019).

The third topic relates biodiversity to the investment and development activity of REITs, real estate investments trusts. In the spirit of Eichholtz, Kok and Yonder (2012), this topic aims to uncover how biodiversity is integrated in REIT investment management. At the most simple level, REITs own buildings that have a physical footprint: how big is that footprint, how many buildings are greenfield developments, and how does this translate into "biodiversity impact"? Once this is understood, metrics of biodiversity at the REIT level can be related to financial performance, measured by alpha, beta, or operating measures.

Title: Peer Effects in Benchmarking
Supervisor: Jaap Bos (j.bos@maastrichtuniversity.nl)
Short text: Whether we are talking about for-profit companies like banks, or not-for-profit organizations like hospitals and courts of justice: benchmarking is everywhere. The notion of a benchmark is that through a (series of) indicator(s), you get an idea where you stand, how much room for approval you have, and possibly also how you can improve. Implicit in that way of thinking is the idea of imitation: you learn from the best, and the benchmarks tell you who that is. But is that really how it works? In reality, individuals, firms and other organizations often choose their peers, and those may be selected on the basis of very different criteria. The purpose of this topic is to investigate the importance of peer effects in the effectiveness of benchmarking, with a focus on efficiency benchmarks.
References:
Bogetoft, P., Hougaard, J.L. Rational Inefficiencies. Journal of Productivity Analysis 20, 243–271 (2003). https://doi.org/10.1023/A:1027347616038
Peter Bogetoft, (1994) Incentive Efficient Production Frontiers: An Agency Perspective on DEA. Management Science 40(8):959-968.

Title: Hypothesis Testing with Reputation Uncertainty
Supervisor: Jaap Bos (j.bos@maastrichtuniversity.nl)
Short text: When you are writing a research project, like a thesis, you typically develop one or more null hypothesis, that you then put to the test. Implicit in the way you test, is – again typically – that you give equal weight to the importance of type I error and type II error. But what happens if the cost of one type of error is much higher than the cost of

the other type of error, for example because of reputation risk? Do you test differently, or do you interpret the same test in a different way?

References:

Shreffler J, Huecker MR. Type I and Type II Errors and Statistical Power. 2023 Mar 13. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 32491462.
Sanbonmatsu, D.M., Posavac, S.S., Kardes, F.R. et al. Selective hypothesis testing. Psychonomic Bulletin & Review 5, 197–220 (1998). https://doi.org/10.3758/BF03212944

Title: Climate-related risk, Homeowners' insurance and Market structure
Supervisor: Stefany Moreno Burbano
(stefany.morenoburbano@maastrichtuniversity.nl)

Short text: The increasing frequency and severity of natural disasters, related with climate change, have had significant impacts on housing markets. Property insurance plays a critical role in safeguarding homeowners by protecting the value of their assets from physical climate risk. However, the insurance market has experienced significant structural changes, especially in areas prone to climate-related disasters, as many insurers have been withdrawing from these high-risk regions. This project aims to explore the intersection between climate-related risk, homeowners' insurance, and market structure in the United States.

Potential research questions include, but are not limited to: homeowners' insurance take-up rates in response to changing flood maps, homeowners' willingness to pay for insurance in high-risk areas, the concentration of insurance markets following natural disasters, the impact of floods/hurricanes on homeowners' insurance contracts, insurance coverage gaps and market structure in high-risk areas. Although the focus is primarily on residential real estate, the research may also extend to commercial real estate, depending on the availability of data.

Literature related:

- Keys, Benjamin J., and Philip Mulder. Property Insurance and Disaster Risk: New Evidence from Mortgage Escrow Data. No. w32579. National Bureau of Economic Research, 2024.
- Sastry, Parinitha, Ishita Sen, and Ana-Maria Tenekedjieva. "When insurers exit: Climate losses, fragile insurers, and mortgage markets." Fragile Insurers, and Mortgage Markets (December 23, 2023).
- Weill, Joakim A. "Flood Risk Mapping and the Distributional Impacts of Climate Information." FEDS Working Paper No. 2023-66, 2023.

Potential databases: FEMA policies and claims, Floodplains, HDMA (Home Mortgage Disclosure Act) data, NOAA disaster databases

Requirements: R (preferred) or Stata for econometric analysis and GIS tools for spatial data. Econometric techniques.

Title: Climate-related risk and its effects on Firms' performance
Supervisor: Stefany Moreno Burbano
(stefany.morenoburbano@maastrichtuniversity.nl)

Short text: In the current scenario of increasing physical climate risks, it is critical to understand how corporations respond to natural disasters. This project intent to study the effects of physical climate risks on firm performance across Europe, focusing on both real and financial corporate indicators to uncover shared trends. The project can be narrowed down to specific industries, markets, or types of natural disasters (i.e. wildfires, windstorms, floods). The aim is to analyze not only the immediate, unanticipated impacts of extreme weather events on real and financial firms' indicators but also the strategic decisions firms make in the aftermath of such climate shocks.

Of particular interest is the insurance sector, where the project could explore whether the structure of the market plays a role in shaping corporate outcomes and decision-making processes following a natural disaster (subject to data availability).

Literature related:

- Benincasa, E., Betz, F. and Gattini, L., 2024. How do firms cope with losses from extreme weather events?. Journal of Corporate Finance, 84, p.102508.
- Martin, R., Muûls, M. and Ward, A., 2011. The sensitivity of UK manufacturing firms to extreme weather events. Supporting research for: CCC, 2011, Adapting to climate change in the UK–Measuring progress.

Potential databases: ORBIS, EMDAT4.
Requirements: R (preferred) or Stata for econometric analysis and GIS tools for spatial data. Econometric techniques.

Thesis Topic: Model Uncertainty and Sustainability Risk Management
Supervisor: Dirk Broeders (d.broeders@maastrichtuniversity.nl)
Short text: This research project explores the intricacies of model uncertainty and its implications for sustainability risk management. Model uncertainty in risk management typically pertains to potential losses arising from models that are either incorrect (Type A), improperly implemented (Type B), or misused (Type C). This study specifically addresses Type A uncertainty, which involves selecting an incorrect functional form or excluding relevant variables, thereby leading to model misspecification.
The central research question, to be formulated by the student, will revolve around comparing the risk characteristics of conventional and sustainable investment options. To this end, the student will employ the concept of Generalized Value at Risk (G-VaR), which extends the conventional understanding of model uncertainty. Introduced by Peng, Yang, and Yao (2023), G-VaR posits that financial return volatility cannot be encapsulated by a single distribution but rather by infinite many statistical distributions. The G-VaR measure identifies the worst-case scenario among these distributions, thereby providing a robust predictive tool under conditions of extreme uncertainty. This method will be applied to compare risk measurements of various stock market indices, both sustainable and regular, enabling the student to derive insights pertinent to sustainability risk management.
Reference: Shige Peng, Shuzhen Yang, Jianfeng Yao, "Improving Value-at-Risk Prediction Under Model Uncertainty," Journal of Financial Econometrics, Volume 21, Issue 1, Winter 2023, Pages 228–259, https://doi.org/10.1093/jjfinec/nbaa022.

Title: Can Socially Responsible Investment (SRI) Truly Achieve Sustainability?
Supervisor: Ge Wang (ge.wang@maastrichtuniversity.nl)
Short text: Socially responsible investing (SRI) has gained significant momentum as an approach to aligning investment portfolios with environmental, social, and governance (ESG) principles. However, the true impact of SRI on corporate behavior and long-term sustainability remains contested. Critics argue that many SRI funds engage in "impact washing," selecting firms with good ESG scores but failing to drive meaningful improvements in these firms' sustainability practices. In this study, you will examine various strategies employed by SRI funds—including divestment and tilting— to assess their actual effectiveness in promoting sustainability. Key performance indicators such as ESG scores, capital costs, green innovation, and social metrics will be analyzed to determine if SRI can tangibly influence firm behavior or whether it remains a symbolic gesture with limited impact. The study will also explore whether different market environments (e.g., US vs. non-US) affect the efficacy of SRI strategies in delivering sustainable outcomes. You can choose to focus on a sample of US and/or European firms to conduct your analysis.
References:
Heath, D., Macciocchi, D., Michaely, R., and C. Ringgenberg, M. (2023). Does socially responsible investing change firm behavior? Review of Finance, 27(6):2057–2083.

Title: Challenges in the design and user adoption of financial planning apps
Supervisor: Thomas Post (t.post@maastrichtuniversity.nl)
Short text: With the emergence of more data and API's new financial planning tools and

apps emerge. These apps aim to provide the user with a much more holistic picture of current finances, future finances, as well as offering guidance to improve financial decisions and well-being.
But the development those apps come with a lot of questions, including the level of functionality, UX design, privacy, and barriers to adoption.
With this project, the thesis student will get access to a prototype app – developed by our team and be able to run, for example, experiments with potential users. Concrete research questions will be defined and narrowed down with the supervisor.
Starting Date: immediately

Contact Dr. Thomas Post well in advance before the thesis skill period to discuss and narrow down the concrete topic and research design.

Title: Reputation bias in hypothesis testing
Supervisor: Jaap Bos (j.bos@maastrichtuniversity.nl)
Short text: in hypothesis testing, we typically stay agnostic about the weight we give to type I and type II errors, respectively. But not all hypothesis testers can afford to give equal weight to both errors. In this thesis, you will carry out a meta analysis of empirical studies in a field of your choice in finance where some researchers have reputation risk and others not.
Link: https://bookdown.org/MathiasHarrer/Doing_Meta_Analysis_in_R/

Title: Impact Investing in Private Markets
Supervisor: Rob Bauer (r.bauer@maastrichtuniversity.nl)
Short text: Many studies have appeared on impact investing in recent years, often defined as: Investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return.. I am especially interested in impact investing in private markets (equity and debt, and potentially also real estate and infrastructure). I envisage a literature review alongside with a meta-analysis or similar of this specific literature.
Potential literature:
Barber, B, A. Morse, and A. Yasuda, 2021, Impact Investing, Journal of Financial Economics, 139, 101016.
Jeffers, J., T. Lyu & K. Posenau, 2024, The Risk and return of Impact Investing Funds, Journal of Financial Economics, 161, 103928.

Title: The Governance of Venture Capital Firms
Supervisor: Rob Bauer (r.bauer@maastrichtuniversity.nl)
Short text: Recently a new database became available on Venture Capital start-up firms. The dataset reports the dynamic composition of 7800 venture capital-backed startup boards from first VC financing to exit over the 2002-2017 period, classifying directors into three types - executives, investors, and independent. It corresponds to the sample used in Ewens and Malenko (2025) "Board Dynamics over the Startup Lifecycle" (Journal of Finance, forthcoming). I would be interested in further studying this database or creating a similar, potentially in a different context or jurisdiction.

Title Topic: ESG mutual funds and the ESG backlash
Supervisor: Jeroen Derwall (j.derwall@maastrichtuniversity.nl)
Short text: There has been a large literature on EGS mutual funds, such as studies on mutual fund flows' responses to ESG labels and studies on mutual fund returns. A number of studies also explore the actual investment choices of ESG mutual fund portfolio managers. This thesis topic focuses on the latter, seeking to understand how ESG mutual funds change their behavior following events that mark 'an ESG backlash' (anti-ESG sentiment, anti-ESG regulation, etc).

Related literature:
Spaans, Derwall, Huij, Koedijk (2023), "Sustainable Finance Disclosure Regulation: Voluntary Signaling or Mandatory Disclosure?" SSRN working paper: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4722820

Title: Investment Behavior Across the Life Cycle: Theory Meets Reality
Supervisor: Marlene Koch (marlene.koch@maastrichtuniversity.nl)
Short text: Portfolio choice theory predicts that young individuals should hold relatively more risky assets and reduce their risk exposure as they age. Yet, in reality, individuals' investment strategies often look very different. Thus, the natural question is where this discrepancy between observed behavior and optimal decision comes from. Under this topic, it might be, for example, interesting to test the theoretical models' predictions using data on individuals' financial decisions over the life cycle, such as data from the Panel Study of Income Dynamics (PSID) or the Survey of Consumer Finances (SCF). Moreover, regression analyses could shed light on the drivers of individuals' empirically observed investment strategies.
References: Cocco, J. F., F. J. Gomes, and P. Maenhout (2005). "Consumption and Portfolio Choice over the Life Cycle," Review of Financial Studies, 18(2), 491–533.
Kaustia, M. and S. Torstila (2011). "Stock Market Aversion? Political Preferences and Stock Market Participation," Journal of Financial Economics, 100(1), 98–112.
Merton, R. C. (1971). "Optimal Consumption and Portfolio Rules in a Continuous-Time Model," Journal of Economic Theory, 3(4), 373–413.
Vestman, R. (2019). "Limited Stock Market Participation Among Renters and Homeowners," Review of Financial Studies, 32(4), 1494–1535.

Title: How Relationship Status Shapes Housing Choices
Supervisor: Marlene Koch (marlene.koch@maastrichtuniversity.nl)
Short text: Buying a home and entering a committed relationship are two of an individual's biggest decisions, and they are closely linked. Under this topic, it is, for example, interesting to shed light on the long-term financial consequences of either marrying or entering the housing market first. A possible data source for the analysis is US panel data, such as the Panel Study for Income Dynamics (PSID). Moreover, regression analyses could shed light on the drivers (e.g., the pool of eligible partners, mortgage availability, borrowing rates, and birth rates) of the timing of these decisions.
References: Bacher, A. (2024). "Housing and Savings Behavior across Family Types," working paper, available at https://annikabacher.github.io/Bacher_JMP.pdf
Chang, M. (2024). "Changing Marital Transitions and Homeownership Among Young Households," Review of Economic Dynamics, 52, 46–63.
Chu, C. Y. C., J. C. Lin, and W. J. Tsay (2020). "Males' Housing Wealth and Their Marriage Market Advantage," Journal of Population Economics, 33(3), 1005–1023.
Fischer, M. and N. Khorunzhina (2019). "Housing Decisions under Divorce Risk," International Economic Review, 60(3), 1263–1290.

Title: Being Asset-Rich but Cash-Poor – Current Challenges and Solution Approaches
Supervisor: Marlene Koch (marlene.koch@maastrichtuniversity.nl)
Short text: Managing illiquid assets such as real estate is a challenging part of households' financial planning problems. Despite generally higher wealth levels than renters, homeowners often struggle to smooth consumption and draw down their savings during retirement due to the illiquidity of their assets and the lack of financial products to tackle the problem. Thus, these individuals are asset-rich but cash-poor. Under this topic, it might, for example, be interesting to study different home equity release schemes such as reverse mortgages and shared ownership. Moreover, one could then address which

types of individuals use which products and what drives the popularity of such products. These driving factors could include, for example, different countries' pension system designs and family statuses. Possible data sources include the US Panel Study of Income Dynamics or HILDA (Household, Income and Labour Dynamics in Australia Dataverse) as reverse mortgages are particularly popular in Australia.

References: Alai, D. H., H. Chen, D. Cho, K. Hanewald, and M. Sherris (2014). "Developing Equity Release Markets: Risk Analysis for Reverse Mortgages and Home Reversions," North American Actuarial Journal, 18(1), 217–241.
Brandsaas, E. E., and J. S. Kvaerner (2024). "Partial Homeownership: A Quantitative Analysis," working paper, available at https://ssrn.com/abstract=4512563
Fong, J. H., O. S. Mitchell, and B. S. Koh (2023). "Asset-Rich and Cash-Poor: Which Older Adults Value Reverse Mortgages?" Ageing & Society, 43(5), 1104–1121.

Title: Keep It Simple? Out-of-Sample Performance of Different Portfolio Choice Strategies
Supervisor: Marlene Koch (marlene.koch@maastrichtuniversity.nl)
Short text: There is a wide variety of portfolio choice strategies, ranging from intuitive and easy-to-implement strategies, such as the 1/N portfolio strategy, to more complex ones, including the mean-variance portfolio strategy. DeMiguel et al. (2009) show that while more complex strategies may exhibit superior performance in-sample, they often do not perform better out-of-sample. In this thesis, recent stock market data can be used to assess whether the findings of DeMiguel et al. (2009) remain valid today and to determine which strategies perform best in different markets and under varying economic conditions.

References: DeMiguel, V., L. Garlappi, and R. Uppal (2009). "Optimal Versus Naive Diversification: How Inefficient is the 1/N Portfolio Strategy?" The Review of Financial Studies, 22(5), 1915-1953.
Markowitz, H. (1952). "Portfolio Selection," Journal of Finance, 7(1), 77-91.

Title: Housing tenure preferences – does the American Dream apply to Dutch reality?
Supervisor: Dirk Brounen (dirk.brounen@maastrichtuniversity.nl)
Short text: Housing is a prime need and concern to households, especially since the housing markets tightened. The costs of housing has gone up, and new generations face a challenging outlook when considering their first and next move into housing. Traditionally, young generations favoured owning a home – sometimes referred to as a cornerstone of the American Dream. But times are changing, and so do generational preferences. I time of longevity (new generations facing longer lives) the traditional rent versus own trade-off is tilting. Hence, it is time to reassess the rational and financial aspects of this housing tenure decision. Using fresh (US/European/Dutch) data and an open, curious mind.
Supervisor: prof. dr. Dirk Brounen (dirk.brounen@maastrichtuniversity.nl)
Requirements: students need to possess analytical skills and experience to handle datasets, and understand finance basics.
Literature suggestion: Goodman, Laurie S., and Christopher Mayer. 2018. "Homeownership and the American Dream." Journal of Economic Perspectives 32 (1): 31–58. DOI: 10.1257/jep.32.1.31

Title: Household finance– asset holding analysis
Supervisor: Dirk Brounen (dirk.brounen@maastrichtuniversity.nl)
Short text: Household finance is the field of financial economics that studies how households use financial instruments and markets to achieve their objectives. Normative household finance studies how households should take financial decisions by building models of optimal portfolio choice and financing decision over the lifecycle. Positive household finance investigates empirically what households actually do with their money

and how they do borrow. This thesis project will do the latter. Using online survey panel dataset(s) you study and map the cross section and time variance of household's wealth portfolio. What do households owe and own? How and why does this differ across households, and over time? Students need to gather and organize the relevant data via https://share-eric.eu/ and/or https://www.centerdata.nl/liss-panel
Supervisor: prof. dr. Dirk Brounen (dirk.brounen@maastrichtuniversity.nl)
Requirements: students need to possess analytical skills and experience to handle large datasets, and understand finance basics.
Literature suggestion: John Campbell, 2006, Household Finance, Journal of Finance 61(4), https://doi.org/10.1111/j.1540-6261.2006.00883.x

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Title: Calibrating the Hull-White Model to the Yield Curve: A Simulation and Pricing Study of Interest Rate Derivatives
Supervisor Yixuan Ma (Yixuan.ma@maastrichtuniversity.nl)
Short text: Interest rate derivatives such as bonds, caplets, swaptions, and interest rate swaps are fundamental instruments in financial markets. Their pricing and risk management depend critically on modeling the evolution of interest rates over time. However, unlike equity markets where the underlying asset follows relatively straightforward dynamics, interest rate markets require models that can fit an entire term structure of interest rates i.e. the yield curve — rather than a single price.
This thesis explores the calibration and application of the Hull-White one-factor model for interest rate derivative pricing. The Hull-White model is widely used due to its ability to fit today's observed yield curve through an analytically tractable term structure.
Literature:
• Brigo, D., & Mercurio, F. (2006). Interest Rate Models - Theory and Practice. Springer.
• Hull, J., & White, A. (1990). Pricing interest-rate-derivative securities. The Review of Financial Studies, 3(4), 573–592.
• Pelsser, A. (2000). Efficient Methods for Valuing Interest Rate Derivatives. Springer.

Title: Machine Learning-Based Calibration of the Term Structure of Interest Rates
Supervisor Yixuan Ma (Yixuan.ma@maastrichtuniversity.nl)
Short text: Traditional calibration of interest rate models, such as Hull-White or CIR, involves minimizing a loss function (e.g., least squares) between model-implied and market-observed yield curves. These optimization procedures can be slow, sensitive to initial guesses, and prone to local minima.
This thesis explores machine learning as a surrogate model to efficiently approximate the mapping between model parameters (e.g., mean-reversion, volatility) and the resulting yield curve shapes. The core idea is to replace or assist the numerical optimization routine with a trained ML model to enhance calibration speed and robustness.
Literature:
• Hull, J. (Chapter on Interest Rate Models)
• Brigo & Mercurio — Interest Rate Models: Theory and Practice (esp. calibration sections)
• Itkin, A. (2021). Machine Learning Techniques for Model Calibration in Finance

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Title: Energy efficiency retrofits & electric vehicle usage: complements or substitutes?
Supervisor: Nils van der Vegte (nils.vandervegte@maastrichtuniversity.nl)
Short text: Examining whether energy efficiency retrofits and electric vehicle (EV) usage act as complements or substitutes sheds light on how households make interconnected energy-related decisions. Both retrofits and EV adoption reduce emissions, but they may compete for limited household budgets or, alternatively, reinforce each other by reflecting broader commitments to sustainability. Understanding these dynamics is vital for policymakers: if the two are complementary, integrated incentive schemes could

accelerate decarbonization; if they are substitutes, poorly designed policies risk crowding out one form of investment. The topic of this proposal is to measure how different energy efficiency retrofits are correlated with electric vehicle usage on a national or subnational level. Solar panels are generally considered as compliments of electric vehicles, but is this also the case for heat pumps or insulation? In the Dutch context, Regional data energy efficiency retrofits on a neighbourhood-level is publicly available via the "Klimaatmonitor" (https://klimaatmonitor.databank.nl/jive), regional data on electric vehicle usage is publicly available via the CBS. However, you can also explore data from other countries.
References:
Nauze, A. L. (2023). Motivation crowding in peer effects: The effect of solar subsidies on green power purchases. Review of Economics and Statistics, 105(6), 1465-1480.
Lyu, X. (2023). Are electric cars and solar panels complements?. Journal of the Association of Environmental and Resource Economists, 10(4), 1019-1057.

Title: Effects of incentives on energy efficiency retrofits: an international analysis
Supervisor: Nils van der Vegte (nils.vandervegte@maastrichtuniversity.nl)
Short text: Energy efficiency incentives are widely used tools to promote sustainable energy transitions within real estate, yet their effectiveness varies substantially across countries. In this topic, students can explore how the design and implementation of these incentives affect outcomes within housing such as energy consumption, energy costs, and efficiency improvements in an international context. By exploiting a panel data structure across multiple countries, you can examine whether differences in institutional frameworks, market structures, or socioeconomic conditions explain variation in policy impacts on energy use within (residential) housing. For example, do generous subsidies in one country lead to stronger long-term efficiency gains than regulatory approaches elsewhere, and if so, what mechanisms account for these differences? An example of a dataset on energy efficiency policies to explore for the European Union is the publicly available MURE dataset (https://www.measures.odyssee-mure.eu/).
References
Aydin, E. (2024). Heterogeneous impacts of building codes on residential energy demand. Energy Economics, 131, 107336.
Thonipara, A., Runst, P., Ochsner, C., & Bizer, K. (2019). Energy efficiency of residential buildings in the European Union–An exploratory analysis of cross-country consumption patterns. Energy Policy, 129, 1156-1167.
Rajbhandari, A., & Zhang, F. (2018). Does energy efficiency promote economic growth? Evidence from a multicountry and multisectoral panel dataset. Energy Economics, 69, 128-139.

Title: The role of regional incentives on energy efficiency retrofits
Supervisor: Nils van der Vegte (nils.vandervegte@maastrichtuniversity.nl)
Short text: Energy efficiency incentives are widely used tools to promote sustainable energy transitions within real estate, yet their effectiveness varies substantially across regions. In this topic, students can explore how the design and implementation of regional energy efficiency incentives within housing affects outcomes within housing, such as the number of energy efficiency retrofits, energy consumption, energy costs, and efficiency improvements. By exploiting differences between regions in a panel-data structure, you can examine the effect of specific regional incentives on energy efficiency retrofits. An important part of this research is to explore regional policies and changes in policies on energy efficiency within a country of choice.
References
Fowlie, M., Greenstone, M., & Wolfram, C. (2018). Do energy efficiency investments deliver? Evidence from the weatherization assistance program. The Quarterly Journal of Economics, 133(3), 1597-1644.
Levinson, A. (2016). How much energy do building energy codes save? Evidence from California houses. American Economic Review, 106(10), 2867-2894.

Title: Cross-Border Real Estate Analysis
Supervisor: Alexandre Jolet (alexandre.jolet@maastrichtuniversity.nl)
Short text: Housing markets don't stop at borders, yet political, fiscal, and social barriers often create striking differences in prices, demand, and investment flows. This thesis invites you to explore how cross-border interactions shape real estate markets and how factors such as taxation, labor mobility, infrastructure, or affordability influence housing dynamics. The goal is to understand how borders can simultaneously divide and connect regional markets, and what this means for households, investors, and policymakers. Possible applications include well-known border regions such as Belgium–Luxembourg, France–Switzerland, or Sweden–Denmark, though you are encouraged to define your own context of interest.
Papers on the topic:
Cohen, V., & Karpavičiūtė, L. (2017). The analysis of the determinants of housing prices. Independent Journal of Management & Production, 8(1), 49–63. https://doi.org/10.14807/ijmp.v8i1.521
Micheli, M., Rouwendal, J., & Dekkers, J. (2019). Border effects in house prices. Real Estate Economics, 47(3), 757–783. https://doi.org/10.1111/1540-6229.12255
Hossain, B., & Latif, E. (2009). Determinants of housing price volatility in Canada: A dynamic analysis. Applied Economics, 41(27), 3521–3531. https://doi.org/10.1080/00036840701522861
Stevenson, S. (2004). House price diffusion and inter-regional and cross-border house price dynamics. Journal of Property Research, 21(4), 301–320. https://doi.org/10.1080/09599910500151228
Adams, Z., & Füss, R. (2010). Macroeconomic determinants of international housing markets. Journal of Housing Economics, 19(1), 38–50. https://doi.org/10.1016/j.jhe.2009.10.005
Helgers, R., & Buyst, E. (2016). Spatial and temporal diffusion of housing prices in the presence of a linguistic border: Evidence from Belgium. Spatial Economic Analysis, 11(1), 92–122. https://doi.org/10.1080/17421772.2016.1102961
Sirmans, G. S., MacDonald, L., Macpherson, D. A., & Zietz, E. (2006). The value of housing characteristics: A meta-analysis. Journal of Real Estate Finance and Economics, 33(3), 215–240. https://doi.org/10.1007/s11146-006-9983-5
Yu, H., Tang, X., & Zhou, Y. (n.d.). Why are housing and services more expensive in rich countries than in poor ones? A model of neighborhood housing effect and its evidence.

When Households Don't Know What They Want: Time-Dependent Preferences and Implications for Financial Product Design
Supervisor: Marlene Koch (marlene.koch@maastrichtuniversity.nl)
Short Text: Annuities and reverse mortgages are designed to improve households' welfare, but households often do not purchase them. A central challenge is that households' preferences are not constant but change over time, and thus, the households' demands for products also change over time. Risk attitudes, liquidity needs, and housing wealth may vary with age, economic conditions, or life events. This thesis examines the role of time-dependent preferences in shaping the demand for financial products. The first step is to study empirical evidence on how household preferences evolve, using survey data. In a second step, these findings can be connected to a theoretical model, for example from game theory, to analyze how financial institutions adjust product design and pricing in response.
References: Armstrong, M., & Vickers, J. (2010). "Competitive Non-linear Pricing and Bundling." Review of Economic Studies, 77(1), 30–60.
Bereby–Meyer, Y., & Roth, A. E. (2006). "Speed of Learning in Noisy Games: Partial Reinforcement and the Sustainability of Cooperation." American Economic Review, 96(4), 1029–1042.

Foà, G., Gambacorta, L., Guiso, L., & Mistrulli, P. E. (2019). "The Supply Side of Household Finance." Review of Financial Studies, 32(10), 3672–3798.
Fong, M.–J., Lin, P.–H., & Palfrey, T. R. (2025). "Cursed Sequential Equilibrium." American Economic Review, 115(8), 2616–2658.
Inkmann, J., Lopes, P., & Michaelides, A. (2011). "How Deep is the Annuity Market Participation Puzzle?" Review of Financial Studies, 24(1), 279–319.

Title: Value at Risk (VaR) en Klimaatrisico's in de Nederlandse corporatiesector
Supervisor: Piet Eichholtz (p.eichholtz@maastrichtuniversity.nl)
Short text: Met de Nationale Prestatieafspraken (NPA) wordt er actief gestuurd op het reduceren van de CO2-uitstoot van het woningbezit van woningcorporaties. Echter is voor het tegenovergestelde effect, de impact van klimaatverandering op vastgoed, momenteel minder aandacht. Klimaatverandering heeft nu al impact op het vastgoed, en dat brengt risico's met zich mee. Kelders met daarin de liftinstallaties komen door aanhoudende neerslag blank te staan, met alle gevolgen van dien voor de (oudere) bewoners van het complex door defecte liften, maar ook voor de kasstromen van de corporatie (kosten herstelwerkzaamheden). In welke regio's spelen welke klimaatrisico's? In hoeverre worden klimaatrisico's al meegenomen bij keuzes voor nieuwbouw en renovatie? En hoe groot is de maatschappelijke vastgoedwaarde die op het spel staat?

Dit onderzoek richt zich op de ontwikkeling van een model voor de Nederlandse corporatiesector, waarbij het financiële risico, ofwel de Value at Risk (VaR), wordt berekend. Het model combineert data van de Autoriteit woningcorporaties (Aw) met daarin woningkenmerken zoals kasstromen, bouwjaren, en portefeuille-eigenschappen, met data over klimaatrisico's om inzicht te krijgen in de landelijke en regionale Value at Risk (VaR). Met deze scriptie breng je een onderbelicht maatschappelijk risico in kaart en draag je bij aan de kwantificeerbaarheid van klimaatrisico's.

Mogelijke onderzoeksvragen
- Hoe beïnvloeden klimaatrisico's de nieuwbouw- en renovatiekeuzes?
- Is er een relatie tussen woningcorporaties met hoge hittestress-scores en het wegwerken van EFG-labels?
- Wat is de VaR voor de corporatiesector in Nederland op basis van kasstromen en portefeuillekenmerken?
- Hoe (on)rendabel zijn klimaat adaptieve maatregelen gezien de mogelijke financiële impact van effectuerende klimaatrisico's?

Methodologie
Het onderzoek gebruikt gedetailleerde geografische data (lengte- en breedtegraad, postcode, etc.) en corporatiedata over woning- en financiële kenmerken om een VaR-model te bouwen. Dit model visualiseert de waarderisico's op een kaart.
Relevantie
Dit onderzoek integreert Value at Risk (VaR)-modellen met vastgoedbeheer en klimaatrisico's, wat bijdraagt aan academische literatuur over risicomanagement, duurzame investeringen en de impact van klimaatverandering op de vastgoedsector. Daarnaast biedt dit onderzoek de corporatiesector inzicht in de financiële risico's, gerelateerd aan klimaatverandering en draagt het bij aan het kwantificeren van een onderbelicht risico. Het onderzoek objectiveert en agendeert de maatschappelijke discussie over klimaatrisico's en helpt bij de bewustwording voor woningcorporaties om hun woningen klimaat adaptief te bouwen/renoveren.
Data
- Dataset met daarin BAG-informatie en de financiële en vastgoedeigenschappen van de woningen van de Autoriteit woningcorporaties (Aw) - exclusief beschikbaar gesteld voor de scriptie
- Klimaatdata uit de Klimaateffectatlas met daarin de klimaatrisico's (wateroverlast, hittestress, etc.) voor heel Nederland

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Title: De invloed van Verenigingen van Eigenaren (VvE's) op energielabels en verduurzaming
Supervisor: Piet Eichholtz (p.eichholtz@maastrichtuniversity.nl)
Short text: Circa 13% (300.000 woningen) van het bezit van woningcorporaties is onderdeel van een VvE. In de transitie naar een duurzamere gebouwde omgeving en het wel of niet halen van landelijke doelstellingen spelen Verenigingen van Eigenaren (VvE's) een cruciale rol. VvE-constructies zorgen namelijk voor een hapering in de verduurzaming van het vastgoed. Dit heeft te maken met de vereisten voor instemming van de woningeigenaren, huurders en de moeizame samenwerking onderling. Maar welke rol spelen de individuele belemmeringen bij de moeizame verduurzaming van VvE's? Welke effecten heeft dit op de energietransitie van de corporatiesector? En in hoeverre wordt in dit VvE-segment van de corporatievoorraad toegewerkt naar het uitsluiten van EFG-labels in het bezit na 2028?

Dit onderzoek richt zich op de vraag in hoeverre het bestaan van VvE's invloed heeft op de verduurzaming van gebouwen en welke factoren renovatie- en energielabelverbeteringen bepalen. Hierbij wordt gebruik gemaakt van data van de Autoriteit woningcorporaties (exclusief beschikbaar voor deze scriptie) om de kans op energielabelstappen bij VvE-constructies ten opzichte van niet-VvE-constructies in beeld te brengen. De impact van deze scriptie zit hem in het kwantificeren van de omvang van een maatschappelijk probleem (achterblijvende verduurzaming van VvE's) dat meer politieke aandacht verdient.

Mogelijke onderzoeksvragen
- VvE's en renovatiekansen: heeft het bestaan van een VvE invloed op de kans dat een gebouw wordt gerenoveerd en een beter energielabel krijgt?
- Dominantie van woningcorporaties: hoe verandert de invloed van woningcorporaties binnen VvE's over de tijd, en welke impact heeft dit op renovatiebeslissingen?
- Verklarende factoren: welke factoren, zoals VvE-structuur, eigendomsverdeling en regio, verklaren de renovatiegraad in een bepaald jaar?
- Corporaties en verduurzaming: in welke mate dragen woningcorporaties bij aan de verduurzaming van woningen binnen VvE's, en wat belemmert hen hierin?

Methodologie
Dit onderzoek maakt gebruik van analyses om de invloed van VvE's op renovaties en energielabelstappen te onderzoeken, met data over tijd en regio's. Daarnaast is ook het houden van interviews met bijvoorbeeld voorzitters van VvE's een mogelijkheid om de context en moeilijkheden bloot te leggen.

Relevantie
Dit onderzoek vult een gat in de academische literatuur door de invloed van VvE's op verduurzaming te analyseren, met belangrijke implicaties voor duurzaam vastgoedbeheer en beleidsvorming. Daarnaast zijn deze VvE-constructies niet alleen in Nederland een bekend fenomeen, maar zijn de implicaties van dit onderzoek ook relevant buiten Nederland. De resultaten kunnen beleidsmakers en woningcorporaties helpen om belemmeringen bij verduurzaming in VvE's weg te nemen en de samenwerking binnen VvE's te verbeteren.
Data
- Dataset van de Autoriteit woningcorporaties (Aw) met daarin vastgoedkenmerken, energielabels en VvE-informatie, exclusief beschikbaar gesteld voor de scriptie.

Title: Financial shocks under the passive EFT boom
Supervisor: Jean-Maurice Henkel (jean-maurice.henkel@maastrichtuniversity.nl)
Short text: Exchange-traded funds (ETFs) representing passive investment strategies have gained considerable momentum. However, what implications does this trend hold for financial markets correlation of asset prices? Of particular significance may be the impact on individual investors who maintain passive exposure to market portfolios during periods

of financial turbulence, such as the market shock experienced on 2nd April 2025.
Longin and Solnik (2001) demonstrated that during substantial market downturns, correlations increase markedly, thereby undermining the benefits of portfolio diversification. These empirical findings support the adage that "the only thing that goes up in a crisis is correlation." Assets that previously exhibited low or negative correlations, thus contributing to well-diversified portfolios, become highly interdependent during crisis periods.
This phenomenon raises several critical questions: To what extent might passive investor losses be amplified during financial shocks? Across which equity classes and industrial sectors do correlations demonstrate the most pronounced increases? Furthermore, what strategies might be implemented to mitigate the risk of correlation increase under market downturns?
Literature:
Bryan Kelly, Hao Jiang, Tail Risk and Asset Prices, The Review of Financial Studies, Volume 27, Issue 10, October 2014, Pages 2841–2871, https://doi.org/10.1093/rfs/hhu039
Emirhan Ilhan, Zacharias Sautner, Grigory Vilkov, Carbon Tail Risk, The Review of Financial Studies, Volume 34, Issue 3, March 2021, Pages 1540–1571, https://doi.org/10.1093/rfs/hhaa071
Longin, F. and Solnik, B. (2001), Extreme Correlation of International Equity Markets. The Journal of Finance, 56: 649-676. https://doi.org/10.1111/0022-1082.00340

Title: Tail Risk and Sin Stocks
Supervisor: Jean-Maurice Henkel (jean-maurice.henkel@maastrichtuniversity.nl)
Short text: Human beings inherently aspire to make meaningful contributions to society. An increasing body of literature acknowledges that employment within organisations perceived as negative to societal welfare correlates with diminished employee motivation, necessitating higher compensation packages compared to roles deemed socially beneficial. Yet do this fundamental human characteristics manifest similarly within equity markets?
Academic research reveals a paradoxical phenomenon: sin stocks consistently outperform ethical investments (Karim et al., 2022). Philip Morris, a constituent of the Dividend Aristocrats index, exemplifies this trend. Over a five-year period, the company generated approximately 166% total shareholder return (TSR), translating to an annualised equity return of 19.27%.
This performance raises compelling questions regarding the risk profile of sin stocks during periods of financial distress. Do investors maintain their allegiance to equities with negative societal externalities during market turbulence? Alternatively, does the premium return associated with these investments adequately compensate for heightened risk exposure in volatile market conditions?
The relationship between moral sentiment and investment behaviour becomes particularly salient during crisis periods, when flight-to-quality dynamics typically favour assets perceived as fundamentally sound. Whether sin stocks can sustain their performance advantage amid such circumstances warrants empirical investigation.
Literature:
Karim, Sitara and Lucey, Brian M. and Naeem, Muhammad Abubakr, Do Ethics Outpace Sins? (February 4, 2022). Available at SSRN: https://ssrn.com/abstract=4025988 or http://dx.doi.org/10.2139/ssrn.4025988
Bryan Kelly, Hao Jiang, Tail Risk and Asset Prices, The Review of Financial Studies, Volume 27, Issue 10, October 2014, Pages 2841–2871, https://doi.org/10.1093/rfs/hhu039
Barbara Čeryová, Peter Árendáš, Time-varying relationship and diversification between sin stocks, Bitcoin and gold, International Review of Financial Analysis, Volume 106, October 2025, https://doi.org/10.1016/j.irfa.2025.104533

Title: Beyond the Representative Agent: Household Heterogeneity and Financial

Decision-Making
Supervisor: Quinn Ramakers (quinn.ramakers@maastrichtuniversity.nl)
Short text: How individuals behave in terms of saving and investing is a widely studied topic. Generally, this is done using so-called life-cycle models and dynamic optimisation problems, where we solve for the optimal behaviour of a representative agent. Although these methods are optimal for a certain stylized model, there are numerous examples where, on the individual/subgroup level, the observed behaviour varies wildly from the model predictions. To explain this we can take into account the heterogeneity of agents/households. Think along the lines of different household composition, housing choice, income streams, behavioural biases, exposure to differing risks, etc. Ideally we (you) find an interesting hypothesis about one specific aspect of heterogeneity and how that impacts the individual's financial choices. Which is then tested using the literature's predictions of behaviour and the observed data of decision making, before trying to explain this difference in behaviour.
Relevant literature:
Cocco, J. F., Gomes, F. J., & Maenhout, P. J. (2005). Consumption and portfolio choice over the life cycle. The Review of Financial Studies, 18(2), 491-533.
Merton, R. C. (1969). Lifetime Portfolio Selection under Uncertainty: The Continuous-Time Case. The Review of Economics and Statistics, 51(3), 247–257. https://doi.org/10.2307/1926560

Title: From Black-Scholes to Black Boxes: Constructing Replicating Portfolios with Machine Learning
Supervisor: Quinn Ramakers (quinn.ramakers@maastrichtuniversity.nl)
Short text: While closed-form solutions exist for the pricing of certain types of financial contracts, famously the Black–Scholes equation, calculating them depends on the ease of calculating their conditional expectation, which is not always feasible. An alternative is to replicate such a contract using a combination of contracts that lead to the same payoffs and have a known pricing formula. Traditional approaches use regression now-or-later techniques; however, these can suffer from certain problems and are very dependent on the quality of the choice of basis functions. An alternative is to use machine-learning methods to construct these replicating portfolios. The goal of this thesis is to review what has been done in the literature, implement an interesting alternative, and compare their relative performances.
While you do not have to write this code completely from scratch, many good packages exist for machine learning. You will require a basic knowledge of programming to use these packages.
Related literature: Carr, P., Ellis, K. and Gupta, V. (1998), Static Hedging of Exotic Options. The Journal of Finance, 53: 1165-1190. https://doi.org/10.1111/0022-1082.00048
James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An introduction to statistical learning: With applications in R. Springer (https://www.statlearning.com/)

Title: Climate Risk and Real Estate Prices
Supervisor: Philibert Weenink (Philibert.weenink@maastrichtuniversity.nl)
Short text: Climate change poses increasing risks to real assets, with growing evidence that environmental threats—such as hurricanes and sea-level rise—depress property values (Bernstein et al. 2019, Addoum et al. 2023). However, the gradual and chronic nature of climate change often complicates causal identification. This thesis aims to overcome this challenge by exploiting an external event that rapidly and exogenously altered flood risk exposure levels in New Zealand. By leveraging this natural experiment, the study seeks to provide a clear and causal estimate of the impact of flood risk on real estate prices.
A key component of the project will be the collection and construction of a novel dataset. This may involve strategies such as systematic web searches, data scraping, or engaging with government agencies, insurers, and private data providers. Creativity and

resourcefulness in sourcing and combining data will be central to the success of the thesis.
Literature:
Addoum, J. M., Eichholtz, P., Steiner, E., & Yönder, E. (2024). Climate change and commercial real estate: Evidence from Hurricane Sandy. Real Estate Economics, 52(3), 687-713.
Bernstein, A., Gustafson, M. T., & Lewis, R. (2019). Disaster on the horizon: The price effect of sea level rise. Journal of financial economics, 134(2), 253-272.

Title: Climate Risk Insurance and Cross-Subsidies
Supervisor: Philibert Weenink (Philibert.weenink@maastrichtuniversity.nl)
Short text: Insurers play a central role in mitigating climate risk by identifying threats and incorporating them into insurance premiums, thereby putting a price on risk. However, evidence suggests that premiums are not always adequately aligned with underlying exposures. Instead of differentiating sharply between high- and low-risk areas, insurers often spread costs more broadly, effectively creating cross-subsidies. This practice may unintentionally encourage settlement in exposed areas (Oh et al., 2022). This thesis will investigate the presence and magnitude of such cross-subsidies in the Dutch home insurance market. By comparing premiums across regions with varying levels of climate exposure, it aims to assess whether risk is appropriately priced or implicitly redistributed. The analysis should provide insights into the efficiency and equity of current insurance practices in the face of rising climate risks.
Literature:
Oh, S., Sen, I., & Tenekedjieva, A. M. (2021). Pricing of climate risk insurance: Regulation and cross-subsidies. Journal of Finance, Forthcoming.

Title: Assessing the Role of Cryptocurrencies in Central Bank Portfolios Through Principal Component Analysis
Supervisor: Dirk Broeders (d.broeders@maastrichtuniversity.nl)
Short text: The inclusion of cryptocurrencies on the Fed's balances sheet has sparked considerable debate, particularly given their high volatility and ambiguous role as an asset class. This thesis aims to empirically assess whether cryptocurrencies can support the core objectives of central bank asset holdings, such as monetary policy implementation, wealth preservation, market intervention, technological experimentation, or pension fund investments. To evaluate the potential role of cryptocurrencies in central bank portfolios, this study investigates their empirical behavior and diversification properties relative to traditional asset classes. Specifically, it examines whether cryptocurrencies represent a fundamentally new asset type or merely a speculative investment vehicle. The student conducts a principal component analysis (PCA) on a broad investment universe, including cryptocurrencies, traditional currencies, commodities, volatility indices, inflation measures, equities, and fixed income. The analysis focuses on standardized returns to mitigate the dominance of volatile asset classes. The PCA identifies key factors driving correlations among asset classes, with particular attention to whether cryptocurrencies serve as a diversifier or hedge against economic downturns. Additionally, portfolio optimization along the efficient frontier evaluates the practical implications of including cryptocurrencies in diversified portfolios.
Guinda, María and Bhattacharyya, Ritabrata, Using Principal Component Analysis on Crypto Correlations to Build a Diversified Portfolio (July 30, 2021). Available at SSRN: https://ssrn.com/abstract=3918398 or http://dx.doi.org/10.2139/ssrn.3918398

Title: Exploring household financial well-being
Supervisor: Larissa Zimmermann (larissa.zimmermann@maastrichtuniversity.nl)
Short text: Households have an increasing responsibility for their own financial well-being, including budgeting and saving decisions, as well as securing financial independence and security in retirement. Understanding how people perceive their financial situation becomes critical, as subjective financial well-being often diverges from

objective measures such as income or wealth. This project could examine different ways to capture financial well-being by comparing established financial well-being scales in a Qualtrics survey and conducting a factor analysis on the responses to assess underlying measurement dimensions. It could also explore how different demographic groups interpret financial well-being , and to what extent subjective financial well-being aligns with objective indicators. The project could furthermore investigate which individual or household characteristics—such as financial literacy, housing situation, or family composition—help explain differences in financial well-being, providing insight into its determinants. The topic leaves a lot of room to explore financial well-being from different angles.

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- Prawitz, A., Garman, E. T., Sorhaindo, B., O'Neill, B., Kim, J., & Drentea, P. (2006). InCharge financial distress/financial well-being scale: Development, administration, and score interpretation. Journal of Financial Counseling and Planning, 17(1).

Title: Attack or Bail: Strategic Decision-making in Complex and Uncertain Environments
Supervisor: Stefan Weiland (stefan.weiland@maastrichtuniversity.nl)
Short Text: Firms operating in markets of imperfect competition face several crucial strategic choices. One of the most important choices is whether to undercut rivals on price by becoming more productive in producing the same product, or to seek differentiation in the product space to avoid direct price competition. This project seeks to empirically compare the performance outcomes of these strategies across different industries. Using firm-level data and associated industry-codes, the student will examine if prioritizing cost efficiency- versus product differentiation is more successful in driving profitability, and whether an industry's level of complexity and/or modularity moderates the outcome. In non-technical terms, a production environment is complex if a firm likely gets stuck in local optima when searching for the most productive configurations. Further, a production environment is modular if a firm can switch product variants without any non-systematic change in productivity. The student has full flexibility in choosing the industries, provided that suitable data is available.

References:

Rajiv D. Banker, Raj Mashruwala, Arindam Tripathy; Does a differentiation strategy lead to more sustainable financial performance than a cost leadership strategy?. Management Decision 10 June 2014; 52 (5): 872–896. https://doi.org/10.1108/MD-05-2013-0282

Belleflamme, P. (2001). Oligopolistic competition, IT use for product differentiation and the productivity paradox. International Journal of Industrial Organization, 19(1-2), 227-248.

Title: Uncovering the Truth: Sensitivity Analysis in Efficiency Estimation
Supervisor: Stefan Weiland (stefan.weiland@maastrichtuniversity.nl)
Short text: In empirical research, we are often interested in explaining the relationship between two or more phenomena. We make certain assumptions about the data generating process, estimate the parameters that describe the respective relationship, and judge our results based on their statistical significance. Importantly though, while our findings may turn out to be statistically significant, they may fail to accurately describe the true relationships if our initial assumptions were wrong in the first place (poor internal validity). This challenge is common across all parametric frameworks you've encountered so far, including single and multiple linear regression, ANOVA, and others. For this research project, you will conduct an empirical study using stochastic frontier analysis (SFA), a well-established method for estimating efficiency across various industries. You will have considerable flexibility to choose an industry that interests you— whether it's banking, courts, electricity, agriculture, or another sector. The task will involve estimating

efficiency values using SFA, based on certain parametric assumptions. From there, you will perform a thorough sensitivity analysis, assessing how changes in these assumptions affect your results. This process will deepen our understanding of the robustness of efficiency estimates and highlight the pivotal role of model assumptions in empirical research.

References: Van Nguyen, Q., Pascoe, S., Coglan, L. et al. The sensitivity of efficiency scores to input and other choices in stochastic frontier analysis: an empirical investigation. J Prod Anal 55, 31–40 (2021). https://doi.org/10.1007/s11123-020-00592-8

Title: Female Entrepreneurship in Latin America and the Caribbean: Financing Constraints, Macroeconomic Volatility, and the Role of Remittances

Supervisor: Dominique Lopez (Dominique.lopez@maastrichtuniversity.nl)

Short Text: Female entrepreneurship is gaining increasing recognition for its role in advancing economic growth (Hossain et al., 2025; Rejeb et al., 2025). Yet, female entrepreneurs face many financial barriers, more so than their male counterparts (Morazzoni & Sy, 2022; Muravyev et al., 2009; Thompson et al., 2012). Banks typically tighten their lending when macroeconomic conditions worsen, such as during periods of high inflation. The result of this tightening can have negative consequences for female entrepreneurs, who are already at the margin of formal credit access (de Andrés et al., 2021). Although research on female entrepreneurship is growing, the Latin America and Caribbean (LAC) region remains comparatively understudied. The LAC region is characterized by frequent macroeconomic volatility and instability in financial markets (Giraldo, 2025; Del Tedesco Lins, 2024). These conditions further constrain financing opportunities for (female) entrepreneurs (Khan et al., 2023; Moscalu et al., 2019).

The student has the flexibility to approach this thesis topic in various ways. One approach is to examine how access to finance and financial development indicators interact with macroeconomic volatility in shaping (female) SME entry. Alternatively, the student may choose to focus on the role of remittances and diaspora capital flows, which are particularly significant in the LAC context (Maldonado & Harris, 2024; Tyburski, 2023). These inflows often serve as informal buffers, providing households and entrepreneurs with additional liquidity outside the formal financial system (Alhassan et al., 2025; Jia et al., 2025; Silva et al., 2021). For (female) entrepreneurs, remittances can serve as seed capital, enabling them to overcome barriers to entry when traditional credit is inaccessible (Bettin et al., 2024; Nanyiti & Sseruyange, 2021). Beyond startup financing, these resources can also help startups become more resilient to macroeconomic shocks (Steinbache & Bucher, 2024). Therefore, female entrepreneurship is at the center of this study, but the scope can include SMEs with the opportunity to look at macroeconomic and financial conditions, or, from a remittance focused angle, within the LAC region.

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Title: Model free portfolio strategies
Supervisor: Peter Schotman (p.schotman@maastrichtuniversity.nl)
Short text: Traditional advice for young people is to invest heavily in equity and reduce the equity weight in their portfolio when they grow older. In a recent series of studies, Anarkulova et al (2022, 2025) challenge the standard view on how to invest for retirement income. They mploy a different methodology to construct an optimal investment plan. Instead of first specifying a model for returns, they acknowledge that models can be wrong, and even if they are correct, the inputs may be very poorly estimated. Instead of relying on a model for returns, they draw directly from historical evidence in many countries. This broader perspective implies more risk than conditioning on a very specific model for US financial markets. For a thesis there are numerous potential extensions of their ideas. One area of particular practical interest is developing simple rules that work well in this setting.
Literature:
Anarkulova , A., S. Cederburg and M. O'Doherty (2022) Stocks for the long run? Evidence

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developed markets, Journal of Financial Economics 143, 409-433.
https://doi.org/10.1016/j.jfineco.2021.06.040
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lifecycle investment advice, SSRN working paper.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4590406

Title: Pension plan investments
Supervisor: Peter Schotman (p.schotman@maastrichtuniversity.nl)
Short text: Each quarter DNB, the Dutch Central Bank, publishes a set of scenarios for stocks, bonds and inflation, that pension funds should use to evaluate their pension plans. An interesting question for a thesis project is to analyse what portfolio strategy would be optimal based on the published scenarios. Moreover, how robust are such optimised strategies? In other words, suppose you optimise with one set of scenarios, what is the performance of these strategies when evaluated on another set of DNB scenarios. It may be difficult to construct the very best strategy, but there exist various reasonable strategies that are easy to explain and probably near optimal for many people. Choosing the best among these and evaluating them under different scenario sets will provide an insight in the robustness of the portfolio strategies.
Scenarios are published at: https://www.dnb.nl/voor-de-sector/open-boek-toezicht/sectoren/pensioenfondsen/dnb-publiceert-definitieve-scenariosets-bij-wet-toekomst-pensioenen/#id06pq86rrk
The website is in Dutch, but even you cannot read Dutch you can still download the spreadsheets with 20,000 (or more) numerical scenarios with returns.
Literature:
Grebenchtchikova, Anna, Roderick Molenaar, Peter Schotman and Bas Werker (2017) Default life-cycles for retirement savings, Netspar Design Paper 70.
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Rodrigues, P., and P. Schotman (2025) Costs of suboptimal investments, Netspar Industry Paper 2025-20. https://www.netspar.nl/wp-content/uploads/Netspar-Industry-Paper-2025-20.pdf

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Thesis topic: Marketing Excellence (MXC) and Shareholder Value
Supervisor: André Tomano (andre.tomano@maastrichtuniversity.nl)
Short text:
For a long time, ratings and rankings have been widely published, used, and followed not only by the business world (e.g., ESG or credit ratings) but also by individuals (e.g., Michelin stars, Amazon ratings). However, it is surprising that such a simple and intuitive indicator is lacking for assessing a firm's MXC. Initial attempts to address this gap have been made from both academic (Homburg et al., 2020) and practitioner (Burggraeve, 2021) perspectives.

Homburg et al. (2020) describe MXC as a firm's activities that shape the organization, market, and environment. They develop a 218 words MXC dictionary to identify firms with MXC in their respective letters to shareholders. They use this approach to build portfolios to analyse firm value implications. They base their reasoning on the shareholder value concept (Srivastava et al., 1998) and argue that strategic marketing concepts such as MXC can drive firm value, as shareholders can assume that firms with MXC deliver sustainable quality and value to their customer on the long-term. Overall, their MXC portfolio reveals significant abnormal returns of up to 8.58% compared to benchmark portfolios, such as 'marketing capabilities' and 'market orientation' in the period from April 2000 through June 2018.

The goal of this thesis is to build upon these existing efforts by developing a novel conceptualization of MXC. This framework will then be applied to a sample of firms to infer its impact on financial performance, specifically in terms of firm value, as measured by Tobin's Q or abnormal stock returns. In addition, the performance of this MXC portfolio will be benchmarked against other (marketing) portfolios.

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Thesis topic: Measuring Marketing Metrics in Earnings Calls
Supervisor: André Tomano (andre.tomano@maastrichtuniversity.nl)
Short text: Earnings calls serve as a key tool for managing the informational and relational needs between a firm and their financial stakeholders (Rogers 2000), as they provide one of the most important opportunities to convey a company's narrative to the financial community (Brown et al., 2019).
While written communications like annual reports have grown longer and more complex over time and are often filled with boilerplate content, reducing their clarity and specificity (Dyer et al., 2017), earnings calls provide distinct advantages for both firms and their financial audience. First, they offer a pivotal two-way communication channel, allowing invited analysts to ask questions directly to senior executives, which can yield deeper insights and more credible information (Tasker, 1998). Second, earnings calls offer a more dynamic and interactive way to convey essential information. Third, earnings calls can elicit stock-market reactions as they provide additional, idiosyncratic information beyond what is available in formal reports (Bowen et al., 2002; Chen et al., 2018; Frankel et al., 1999; Price et al., 2012). Thus, earnings calls represent a critical medium for delivering the firm's message to the financial community.

Research has shown that analysts' and investors' evaluations of the firm's future prospects improve when the firm also emphasizes communicating non-financial but material information in their regulatory or voluntary disclosures (e.g. Eccles and Serafeim, 2013; Matsumoto et al., 2011; Orens and Lybaert, 2013).

This thesis aims to explore how and to what extent a firm communicates marketing metrics to the financial audience in earnings calls and how this impacts firm value in the short- and long-term.

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Thesis topic: Extracting Marketing Constructs from Unstructured Text Data Using Natural Language Processing Techniques and Investigating Their Impact on Firm Value
Supervisor: André Tomano (andre.tomano@maastrichtuniversity.nl)
Short text: Berger et al. (2020) argue that marketing strategy scholars often struggle with valid measures of firms' marketing assets, capabilities, and strategic orientations. Meanwhile, firms generate enormous volumes of text through earnings calls, annual reports, press releases, and social media—data that contains rich insights about marketing constructs but remains largely untapped due to methodological challenges.
For instance, The CMO Survey (Fall 2024) reveals that senior marketing leaders are now more likely to participate in earnings calls than board meetings, with participation rising substantially over the past year. This trend underscores earnings calls as critical venues where marketing constructs—brand equity, customer relationships, innovation strategies, and pricing power—are discussed and scrutinized by executives and analysts alike.
Recent developments in Natural Language Processing (NLP) offer powerful tools to systematically extract marketing insights from text at scale. For instance, building on recent work applying dependency parsing and relation extraction to marketing contexts (Martin et al., 2024), this thesis will develop and validate novel text-based measures of marketing constructs. The approach moves beyond simple word counting, capturing how marketing concepts are discussed rather than just their frequency. For instance, dependency-based methods can distinguish between "we raised prices successfully" (positive pricing power) and "we cannot raise prices" (negated claim), nuances that bag-of-words approaches miss.
The goal of this thesis is to: (1) identify an underexplored marketing construct amenable to text-based measurement (e.g., customer centricity, brand authenticity, innovation orientation, channel power); (2) develop a theoretically-grounded NLP methodology; (3) apply this methodology to a large corpus of corporate communications (earnings calls, letters to shareholders, or MD&A sections); and (4) validate the measure against existing proxies and test its predictive validity for firm value outcomes such as stock returns, Tobin's q, or Total q.
The thesis will contribute to the emerging stream of research on text-as-data in marketing (Berger et al., 2020) while providing practical tools for researchers and practitioners to measure previously hard-to-quantify marketing constructs at scale.
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Title: Regional Allocation under Geopolitical Risk
Supervisor: Roger Otten (r.otten@maastrichtuniversity.nl)
Short text: Many (institutional) Investors implement their strategic Asset Allocation to equities via an index strategy that follows a standard Global Equity benchmark. Geopolitical events may require invest to re-think a passive exposure to a standard Global Equity benchmark (like MSCI World). For instance by reducing the weight to one region and re-allocating to another. Or even to re-weigh exposure to certain sectors (like defence).

You will study the impact of changing the regional allocation of the Global benchmark. Among others via historical back-tests you study the risk/return properties of alternative weighting schemes. Also you research ways to measure Geopolitical risk.

Title: Active vs. Passive Investment: Long-run Outperformance Tests with Fundamental and Analyst-Based Strategies
Supervisor: Janek Kretschmer (j.kretschmer@maastrichtuniversity.nl)
Short text: A central question in finance is whether simple, rules-based active strategies can reliably outperform passive benchmarks net of risk and realistic costs. With the growth of low-fee index funds (e.g., S&P 500, MSCI World) and the parallel availability of rich fundamental and analyst data, this thesis examines the long-run performance of transparent active strategies that households and institutional investors could plausibly implement.
Using equity-level data from FactSet (or comparable databases), you will construct portfolios based on value and expectation-based signals—such as (forward) P/E, price-to-book, earnings yield, analyst recommendation levels/changes, target-price gaps, and earnings-revision momentum. The project will compare these strategies against major indices over multiple decades, evaluating risk-adjusted returns (Sharpe, Sortino, Fama-French/Carhart alphas), drawdowns, turnover, and tax-sensitive after-cost performance. Robustness checks will include alternative weighting schemes (value-weighted vs. equal-weighted), rebalancing frequencies, sector/region neutrality, and transaction-cost/tax frictions consistent with household execution.
Methodologically, the thesis will (i) define investable screening rules with clear look-ahead and survivorship-bias controls, (ii) benchmark against passive ETFs/indices, and (iii) test whether combinations of signals (e.g., value × revisions, value × quality) deliver statistically and economically meaningful alphas that persist out-of-sample. A secondary aim is to profile the cyclicality of strategy payoffs (e.g., regimes around recessions, inflation shocks, and rate cycles) to inform timing or diversification across signals.
The empirical part of the thesis will implement and backtest a suite of strategies on U.S. (S&P 500 constituents) and global (MSCI World) universes from at least 2000 onward, with careful data hygiene (point-in-time fields, delisting returns). The expected contribution is to assess which simple active rules—if any—outperform passive investing over the long run once realistic constraints are applied; to offer guidance on how investors could implement such rules; and to discuss whether these findings contradict modern portfolio theory or can be reconciled with it.

Title: Encouraging Effective Donations
Supervisor: Janek Kretschmer (j.kretschmer@maastrichtuniversity.nl)
Short text: Charitable giving plays a prominent role in society, with donations amounting to more than 87.5 billion euro per year in Europe alone.
While concerns about cost-effectiveness is prevalent in everyday life, such thinking seems to be far less common in the context of altruistic decisions - or more specifically, charitable giving. Nevertheless, the question of charities' cost-effectiveness is addressed by NGOs, such as "GiveWell" or "GivingWhatWeCan", conducting independent and scientific charity evaluation. These organizations have shown that some charities can offer interventions that outperform comparable charities in terms of cost-effectiveness by a factor of up to one thousand. The lack of adequate prioritization and donors' inability to evaluate cost-effectiveness information impedes donations to the most effective causes. On the other hand, a recent study suggests that donors feel happiest when they make a clear impact with their donation. New methods to overcome behavioral biases in charitable giving can direct more donations to the most effective interventions. Therefore, this research topic has the potential to help high effective charities to raise funding, increase donors' happiness and the well-being of society as a whole.

The student will have the opportunity to create an own survey and/or experiment subsequent to a literature review to test their hypotheses.

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Title: The Effect of Efficiency Improvements on the Household Energy Burden
Supervisor: Enver Muftic (enver.mufti@maastrichtuniversity.nl)
Short text: Energy costs represent a significant share of household expenditures. The energy burden (energy costs relative to disposable income) is increasingly recognized as a determinant of financial vulnerability. Households with high energy burdens may face greater difficulties in meeting mortgage or rental payments, which in turn creates financial risk. This study would investigate the evolution of the energy burden across Dutch neighbourhoods using panel data on energy costs, household income, and energy efficiency indicators. The analysis contributes to the finance literature by linking energy efficiency directly to household financial vulnerability. The findings would inform if energy efficiency could reduce household vulnerability to energy price shocks. The findings would be relevant to tenants, banks, institutions and policymakers.
Data: https://klimaatmonitor.databank.nl/jive

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Title: Climate Risk, Property Values, and Systemic Financial Exposure in the Netherlands
Supervisor: Enver Muftic (enver.mufti@maastrichtuniversity.nl)
Short text: The financial sector faces increasing exposure to physical climate risks such as flooding, heat stress, and windstorms. In the Netherlands, climate risks are not explicitly taken into account when determining property valuations (WOZ-waarden). Nevertheless, it remains unclear whether such risks may already be implicitly priced. Namely, properties in high-risk neighbourhoods selling at a discount relative to otherwise comparable areas. If climate risks are currently ignored or only partially accounted for, the potential for sudden repricing events remains a concern for financial stability. This study would investigates whether Dutch property values reflect neighbourhood-level climate exposures. In addition, one could conduct a stress test scenarios to estimate the scale of potential financial losses under the assumption that climate risks become fully priced, thereby quantifying a "climate value-at-risk" for the Dutch housing market. The study would contributes to the finance

literature on mispricing and systemic vulnerability. The results would provide insights into the extent to which climate risks are already incorporated into Dutch property values and the potential consequences of their future repricing.
Data: https://www.klimaateffectatlas.nl/en/dashboard
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