

2 - 2015/2016

# PerVectum

magazine of study association

SCOPE | Vectum

Exchange articles by  
Dewi and Nadja

Academic article by  
Iman Honarvar

Recipes from cycling  
dinner

Reflections of the  
activities last period





## PerVectum

Magazine for  
Econometrics students  
at Maastricht University

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# Word of the President

**D**ear Econometricians,

The end of 2015 is approaching and we're getting close to our well deserved Christmas holiday. During this holiday we get the time to celebrate Christmas and New Year with friends and family, but we also finally get the chance to take some days off. It's especially nice due to the long time without a break, making it extra nice to finally reach this holiday. Furthermore, this holiday gives us the opportunity to look back at the first semester.

For our first years their first semester is nearly at an end. For many of you it has probably been a semester full of new challenges. Living in a different city, or even a different country to start with is already a big step. On top of that, the challenges offered by the study might be very overwhelming. Many of you were probably shocked by the intermediate tests. In the meantime, you've also probably lost quite some fellow students. On the other hand, keep in mind that this first semester is for many students a semester of adjustments. Many of us who made it to higher years had issues during our first semester. Hopefully many of you are more comfortable with the program by now. You'll receive your first advice on your BSA after this first semester, so it might be a good moment to reconsider whether this program is suited for you. Take into consideration whether you like, at least to some extent, working for your studies, because that is at least as important as the results obtained so far. We hope that SCOPE | Vectum, or at least our older members, have been able to assist



you during this first semester. Our extra tutorials were used by many of you, and we hope that they helped you in understanding the courses. Furthermore, we hope that many of you know by now, what we have to offer, with all our activities as well!

Our second years have just heard where they will be going during their exchange semester. Many of you were very excited with your destinations and I can tell from experience that all of you will have a great time. Make sure you ask others that have been there for dos and don'ts because this might really enhance your time there. A great example for you are our third years who are currently getting back from their study abroad. Some of them are already back and some others are even staying over New Year's Eve. I really hope that your study abroad has brought you, what you hoped for. Although, you might not be really happy about it yet, we really look forward about seeing all of you again. We really hope to see many of you at our activities again.

For our master students, many of you are already halfway in your masters. This also means that you are getting closer to your professional life. You have to start thinking about future jobs and there are quite some events that lay ahead of you that might help you with this. First of all, subscriptions for LED opened a few weeks ago. This prestigious event will take place in Rotterdam this year and gives you a great opportunity to get into contact with many companies. Since subscriptions are going really fast there will probably be no spots available for second years. Although this is disappointing for our second years, it is a great indication that the event is very popular among students. During the last week of January we, as SCOPE | Vectum, organise our own Business Trip. Bram is currently still busy getting a huge range of companies for this week, but for now make sure you keep these days (25th until the 29th of January) free in your agenda! In block 5 we will also have our Case Day, so make sure you use enough of these opportunities.

For us as a board this is also a moment of reflection. We are halfway our board year by now and, although it's a moment for us to realise how fast the year goes, it is also an opportunity to inform our members on the things we have done so far. Therefore, we would like to invite all of you to our semi-annual GMA on January the 11th.

Furthermore, this is a great moment to look back at our second block. During the first week we had our Oktoberfest. It was a lot of fun and some of us were not as good in beerpong as they had hoped. Others got other, wise lessons during our Oktoberfest. In the second week we had our Research Lecture given by Nalan Bastürk. Unfortunately, I was not able to be there myself, but I heard from many people that they liked it. The third activity was our Casino Night. Here

you got the opportunity to show your skills in probability in practise. We were very pleased to have one of our previous winners, Silas Daalhuizen, present. He was not able to compete with Raymond Goijen, who beat him in a one on one battle as they were the last two ones standing. The famous Winterball took place in the fourth week, and was definitely a great event! It was great to see all you nicely dressed up! A special thanks here goes to all the activities coordinators of all the SCOPE associations. In week 5 we had a cycling dinner. This time all of us had to prepare a dish and it was great to see (or even better, taste) that many of you had talents for things other than just mathematics. In week 6, our last event of this block was the traditional Ice-skating. Although I sometimes felt like Bambi compared to some of our members, it was a great event!

In the second edition of the PerVectum, we have exchange articles from Dewi and Nadja, an article by Iman Honarvar about the risk-return tradeoff, reflections and photos of activities from the previous block and a few puzzles to keep you busy during the holidays.

On behalf of the whole SCOPE | Vectum board 2015-2016, I would like to wish you all a merry Christmas and a happy new year! Enjoy your holidays, make sure you relax enough and we hope to see you all back at our activities in 2016.

Martijn Schoenmaker  
President of SCOPE | Vectum 2015-2016

# Oktoberfest

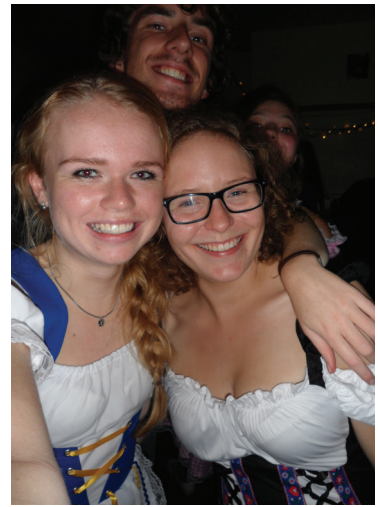
*Written by Chiara Brück*



To stand out from all the other Oktoberfest parties, we decided to celebrate this German highlight not in the official Oktoberfest season but on the 27th of October. Usually the Oktoberfest is carried out during the last two weeks of September and the first two weeks of October. So there we were, all dressed up in Dirndl's, Lederhosen and whatever else we thought looked "German", excited to start the Beer Pong Tournament. I, as a German, was impressed by all the effort other people put in to dress up for this event! At this point, I should mention Marie Ternes who provided what felt like half of the girls with Dirndl's from home. Snacks,

tons of beer and traditional German music were there to get the Oktoberfest Party going. First, the Beer Pong Tournament started a little slow with only one table and two teams playing, but after the first few rounds another table was set up and two matches were played side by side. Around the tables supporters lined up and watched the, especially towards the ending of the round, pretty nerve wracking matches. After every team tried their best, Eric Schulze-Berge and Bas van Andel won the Tournament.





# Research Lecture

On the 2nd of November Nalan Basturk gave an interesting lecture in the field of Econometrics. The lecture introduced basic concepts in Bayesian inference based on real life examples. By using probabilities we got to know the Bayesian way of thinking. This is applied in different fields and becoming more and more popular. Afterwards we went to the Ma van Sloun. As the activity was not on our usually Tuesday night, it was not that busy in the Ma van Sloun, but we still had a great but more relaxed night.





# Dewi's Exchange

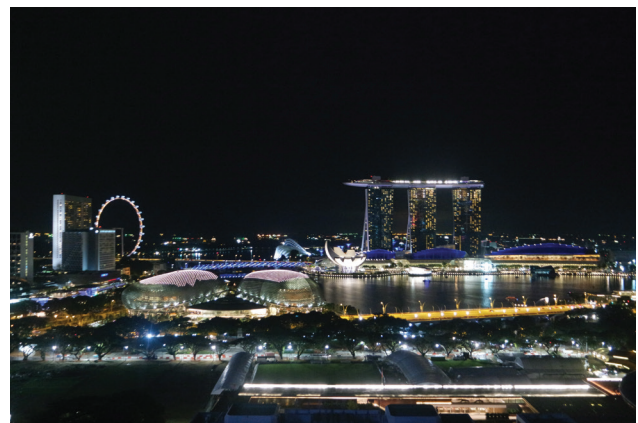


I chose to spend my exchange semester in Singapore for two important reasons. I wanted to experience the way of life in another culture and travel a lot. Singapore is centrally located in south-east Asia which made it incredibly convenient to travel around. Although Singapore is pretty western oriented, it really felt like I was living in another cultural environment. The food at the food courts were Asian, tasteful and super cheap. Residents speak Singlish which is really a different language than English. At first I even thought it was some kind of Chinese language they were speaking!

I spent a lot of time travelling. I started my journey on the 15th of July 2015 in Beijing and Bangkok, on the 28th of July I flew to Singapore. After acquiring my Student Pass and taking care of my school courses I travelled during the semester as well. I chose 5 courses and arranged my schedule in such a way that I was off on Thursdays and Fridays. Next to the midweek travelling I also travelled during the mid-break and the week off before the exam week. So I may not complain at all! The most impressive place I visited was the Great Wall in China. The feeling to walk on that wall is outrageous, it is like heaven on earth. If I start with referring to specific places, a never-ending list will come up, knowing that I forget

mentioning a lot. Nevertheless, I am going to recall some of them. The islands in the south of Thailand, Phuket, Ko Phi Phi and Krabi were the most beautiful islands and beaches I have ever seen. The colours there are madly bright. The combination of the blue water, the green (palm) tree and the white sand blew me away. The skyline in Hong Kong took my breath away. Halong Bay in Vietnam is a miracle to see and drive through on a cruise. Shopping and going out in Bangkok and Kuala Lumpur is so cheap! The people, the beach, the ricefields, and atmosphere in Bali was so inviting and relaxing. I felt very welcome there. In general, visiting a lot of countries and cities in South-East Asia felt like a true blessing.

Obviously, I did not only travel around, I actually spent time in Singapore as well. I visited almost all must-do-tourist-activities such as the Gardens by The Bay, the Colonial District, Orchard Road and Chinatown. I have to say that I loved the Marina Bay, Colonial District and the Quay areas but besides that there was not that much to see. Therefore, I also went to Pulau Ubin, one of the islands of Singapore, and started to do some hiking in the nature reserves of Singapore. Then you really notice you are living only one degree from the equator, this was truly exhausting and sweaty!



Last but not least, I got to meet so much great people here! Spending time and meeting new friends from all over the world was amazing. I met people from Sweden, Italy, Germany, Great Britain, Australia and Canada and traveled a lot with them. I was lucky enough to acquire a spot on campus which I really liked even though it was located 1 hour from the city centre. In this way it was even easier to meet a lot of other exchange and local students and spend time together. I ate a lot at the canteens and went to the pool on campus. Travelling together with other students to the city centre to go out or do a daytrip were regular activities. We always had fun whether we went to Sentosa (island nearby Singapore) to have a swim or went to the National Museum. There was always something going on in Singapore. Unfortunately going out was really expensive during the weekend. Ladies, like me, were lucky on Wednesdays though, free entry with complementary drinks were provided! Going to clubs was really nice compared to the café's in Maastricht, I am going to miss that for sure. I got really close to several other exchange students, I am really going to miss them. On the other hand, I am going to visit them so actually my study abroad triggered a lot of other trips in

the near future. Spending a lot of time with my friends in Singapore is a chapter in my life that I am really grateful for and I will never forget. I also got to know myself a little bit more which resulted in a positive personal development.

All in all, I loved being an exchange student in Singapore and if I had to choose again I would definitely go to Singapore! Oh, by the way, I forget to mention something important: I was very privileged to visit South East Asia and I definitely will go there again, but I also learned to cherish my life in the Netherlands.



# Risk-Return Tradeoff



Research Article by Iman Honarvar

Imagine you want to invest in the market portfolio; the portfolio that includes all the assets in the market such that the weight of each asset in this portfolio is proportional to its market capitalization. If the risk of the market over the next month was zero, then what would have been your expectation about the market portfolio return for the subsequent month? In other words, assuming that the *expected volatility* of the market portfolio for the upcoming month is zero, how much *return* would you have expected for investing in this portfolio. The law of one price says if two assets provide identical cash flows at every single point in time in the future, then their prices and thereby their (expected) returns must be the same, otherwise there will be a clear arbitrage opportunity in the market. Therefore, if the market is expected to have no risk, its return must be just equal to the risk free rate. As a counterexample, if the market volatility is expected to be zero and the rate of return on the market portfolio and the risk free asset are expected to be 5 and 3 percent, respectively, then investors could buy the market portfolio and short-sell the risk free asset. In this case at the end of the month, they would obtain 5 percent return from their investment in the market portfolio and they must have paid only 3 percent for the risk free asset. Since the volatility of the market was assumed to be zero, investors payoff would be risk-freely 2 percent. This is a clear example of an arbitrage opportunity in the market that does not last for a long time. Therefore, if the market portfolio has no risk, its expected return must be equal to the risk free rate.

Now, let's think of a more realistic case. What if the market portfolio is expected to be risky? For example, what would be your expectation about the market portfolio return, if its volatility over the next month is as high as 10 percent? Then would you still be happy to get the risk free rate as the return on your investment on the market portfolio. Of course, the answer is no. In such cases, if the return on the market portfolio was expected to be as low as the risk free rate, a rational risk-averse investor would choose the risk free asset, because it offers the same payoff while it has no risk.

## Risk-Return Tradeoff

With the same line of reasoning one can say that the higher our expectation about the market volatility is, the higher will be our expectation about the market return over the subsequent periods, i.e. "the more (expected) risk, the more (expected) return". In Finance, this trivial fact is called the "Risk-Return Tradeoff", which provides the foundation for most of the other theories and empirical studies in the field of financial econometrics.

One can test this relationship using the following regression equation:<sup>1</sup>

$$E_t(R_{t+1}^M) - R_t^f = \mu + \lambda \text{Var}_t(R_{t+1}^M), \quad (1)$$

where  $R_{t+1}^M$  and  $R_t^f$ , respectively, stand for the market return and the risk free rate between time  $t$  and  $t+1$ . Moreover,  $E_t(\cdot)$  and  $\text{Var}_t(\cdot)$  are the probability expectations and the variance operators, given the information available up until time  $t$ . In regression equation (1), the intuition dictates that  $\mu$  must be equal to zero and  $\lambda$  must be positive.

<sup>1</sup> In fact, Merton(1980) has already done that!

Only in this case for a market with no risk (i.e.  $\text{Var}_t(R_{t+1}^M) = 0$ ) the expected return (i.e.  $E_t(R_{t+1}^M)$ ) is equal to the risk free rate ( $R_{t+1}^f$ ), and with an increase in the market portfolio risk ( $\text{Var}_t(R_{t+1}^M) > 0$ ) the expected return of the market portfolio exceeds the risk free rate ( $E_t(R_{t+1}^M) > R_{t+1}^f$ ).

### Does The Risk-Return Tradeoff Hold?

Although the risk-return tradeoff is theoretically intuitive, the existence of such a relationship has been extensively empirically disputed. While many papers in the literature find a positive relationship between risk and return,<sup>2</sup> many studies argue that either this relationship is very weakly positive, or it is even negative.<sup>3</sup> For example Ghysel, Santa-Clara, and Valkanov (2005) argue that the previous measurement methods for computing the market volatility (such as the GARCH model, etc.) are not very accurate. Instead, they measure the market volatility using the mixed data sampling technique (MIDAS), and show that in this case the risk-return relation is indeed positive. Lundblad (2007) shows that the current history of the data that we have does not give us enough econometric power to find a precise estimation for  $\lambda$  in the regression equation (1), and therefore perhaps the negative relation, found by the other authors, is a result of our poor estimation technique. On the other hand, some authors such as Brandt and Kang (2004) find a strong and robust negative correlation between risk and return.

### What If The Relation Between Risk And Return Is Negative?

We all know that investing in the market portfolio is always risky (i.e.  $\text{Var}_t(R_{t+1}^M) > 0$ ), therefore the expected return on the market portfolio must always be more than the risk free rate ( $E_t(R_{t+1}^M) > R_{t+1}^f$ ). But what if the relation between risk and return is really negative? For example what if  $E_t(R_{t+1}^M) < R_{t+1}^f$ ? In fact, if risk and return are negatively correlated, then many theoretical and empirical facts in finance will also be violated. For example, from the Capital Asset Pricing Model (CAPM), we have

$$E_t(R_{t+1}^i) - R_t^f = \beta_i (E_t(R_{t+1}^M) - R_t^f),$$

where  $R_{t+1}^i$  stands for the return on asset  $i$  and the market portfolio between time  $t$  and  $t+1$ , and  $\beta_i$  is a measure of risk that captures the sensitivity of the excess return on asset  $i$  with respect to the variations in the market excess return. For example,  $\beta_i > 1$  means that the intensity of the variations in the return of asset  $i$  is more than the market portfolio. This feature makes asset  $i$  more risky than the market portfolio, and therefore investors require higher return for investing on this asset than what they expect from investing in the market portfolio (i.e.  $E_t(R_{t+1}^i) - R_t^f > E_t(R_{t+1}^M) - R_t^f$ ). Given that  $\beta_i > 1$ , clearly it is only possible if  $E_t(R_{t+1}^M) > R_t^f$ .

In contrast to physics, in which  $E = mc^2$  is undoubted, most of the phenomena in finance are disputable. The violation of any of these fundamental theories in finance will cast doubt on an enormous body of the literature. The debate about the existence of the risk-return tradeoff is an ongoing topic.

<sup>2</sup> Yu and Yuan (2011), Brandt and Wang (2007), Lundblad (2007), Ghysel, Santa-Clara, and Valkanov (2005), French, Schwert, and Stambaugh (1987)

<sup>3</sup> Brandt and Kang (2004), Whitelaw (1994), Nelson (1991), Campbell (1987)

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# Casino Night

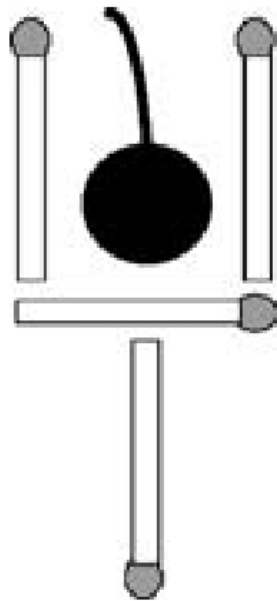
Poker, Blackjack and Roulette. During Casino night our econometricians showed their mathematical skills and put probability theory into practice. As the night went on the stakes got higher and more and more risks were taken. In the finals only six people were left, four first years and two masters. After a severe game of bluffing and chances our first year Raymond Goijen took the prize home.



# Puzzles

## Puzzle 1 - Cherry in a glass

The cocktail cherry is inside the glass, which is formed from four matches. Your task is to move at most two of the matches so that the cherry is then outside of the glass. You can turn the glass sideways or upside down if you wish but the shape must remain the same.

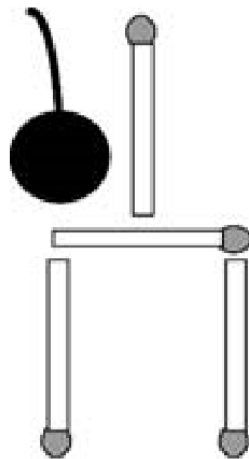


## Puzzle 2 - How old was Diophantus?

Diophantus's childhood lasted one-sixth of his life. His beard grew after one-twelfth more. He married after one-seventh more. His son was born five years later. The son lived to half his father's age. Diophantus died four years after his son. How old was Diophantus when he died?

# Solutions to Puzzles

## Solution Puzzle 1



## Solution Puzzle 2

Diophantus was 84 when he died. Let  $x$  be his age. Then

$$\frac{x}{6} + \frac{x}{12} + \frac{x}{7} + 5 + \frac{x}{2} + 4 = x$$

So,

$$\frac{9}{84}x = 9$$

and  $x = 84$



# Nadja's Exchange

**H**ow am I supposed to decide on where I want to study abroad? What if I regret my choice? What if I do not like the city that I go to? These questions and many more were important last year when I had to choose my exchange destination. Now, one year later, I am convinced it does not matter what you decide on. If you are open-minded and outgoing, every country and city will be fun.

At this very moment, I am sitting in my corridor room in Lund, a small city in the south of Sweden. I am thinking about what I want to tell you about my stay. My first thought is that I love the university and the city where almost half of the inhabitants are students. I arrived here in the beginning of August and it didn't take long to find people to play football with and to hang out with in the sun. That was also when I realized how good Swedes are when it comes to speaking English.

Eventually after two weeks all other international students arrived and there were activities organized by the university almost every day: from speed-friending to barbecues, sport activities in the city park to big welcome parties. The university also offered a Swedish course during the so

called arrival week which is similar to the INKOM week in Maastricht. Starting to learn Swedish was fun especially because it does not take long to speak as it is quite similar to German and Dutch.

One big part of the student life here are the Nations. The 13 Nations are student associations in Lund and got their names from the different provinces of Sweden. Each Nation has their own club, pub and organizes fun activities, lunches and dinners. One of the most popular traditions is a "Sittning" which is a 3 course dinner with up to 200 people who eat, drink and sing together.

What I did not expect to experience here was a cultural shock :D, the biggest difference between the German and Swedish culture is maybe their "Mysfredag". "Mysfredag" would mean "comfortable Friday" when the typical Swedish family has tacos for dinner and spends time together at home. The other thing about Sweden is the massive consumption of "godis" which is a huge variety of candy that can be bought in every supermarket and special candy shops.

All in all I had an amazing time here in Lund and I would give a lot to stay here longer!



# Winterball

*Written by Evy Dooms*



It gets dark way too early, the temperature's dropped significantly and everybody is in need of a vacation. It's that time of year again. Luckily there's a little light in every week on a Tuesday night. This time it came in disguise. Yes indeed, I'm talking about the Scope Winter ball on the 17th of November. After getting all dressed up we gathered at the lovely Italian restaurant, Cucina50, where we enjoyed a delightful meal. Some also had a dessert, but none dared to order Barry, the Elephant ice-cream. Afterwards

we all moved towards the Crowne Plaza Hotel to enjoy a nice combination of music, chatting and drinking. Of course we all put on our masks before entering to start off a night of good fun. Upon entering everyone got a few drinking coupons, which we gladly used to quench our thirst after all that dancing. For the hungry ones there was also the possibility to get some French fries with mayonnaise. After a night of good music and lots of dancing we sang just one last song before going home for the night.





# Cycling Dinner

During the cycling dinner, food and good company were available in abundance. Three courses were served and a nice ride in between to get to the next dish. From home-made hummus to wraps to kaiserschmarrn and chokolatemousse. Apart from the amazing food, the company was great. The changing of places between the courses made you meet new people and gave you the change to hear their stories and taste their food.



# Inspirations from Cycling Dinner

## Recipe for cold cucumber soup with crabs

*By Edwin van der Vegt and Dominik Dribusch*

### Ingredients (for four persons)

- 2 small cucumbers
- 1 avocado
- 2 red onions
- 1 fresh garlic cloves
- 2 tbs (olive) oil
- 125 ml white wine
- 200 ml vegetable broth (cold)
- 150 gr sour cream
- 1 shot balsamico, white
- Salt
- Cayennepepper (or four seasons pepper)
- Pepper
- 4 tbs crabs



### Preparation

1. Cut the cucumbers and avocado in pieces.
2. Stew the chunky diced onions and garlic with the oil in a pan and extinguish them with the wine. Leave it on the cooktop in order to vaporize (some of) the alcohol.
3. Add the broth, sour cream and vegetables, along with balsamico and the spices.
4. Blend it with an immersion blender.
5. Cool it down.
6. Fill the cold soup into glasses and decorate them with the crabs.
7. Bon appétit!

# Inspirations from Cycling Dinner

## Recipe for chocolate mousse

By Anne Pieters and Noah Stegehuis

### Ingredients (for four persons)

- 100 ml water
- 50 gr sugar
- 200 gr pure chocolate
- 2 egg yolks
- 300 ml double cream
- Powdered sugar
- White and pure chocolate (for garnish)
- Blueberries

### Equipment

- Electronic mixer
- Piping bag
- 4 small glasses



### Preparation:

1. Crush the chocolate into small pieces.
2. Heat the sugar together with the water till the sugar has dissolved.
3. Stir the chocolate carefully into the mixture until it has a consistent texture.
4. In the meanwhile whip the egg yolks for around 4 minutes.
5. Add the chocolate mixture to the egg yolks and keep whipping till it is room temperature.
6. Whip 200 grams of double cream till it has the thickness of yogurt and scoop it through the chocolate mix.
7. Scoop the mass into a piping bag and divide it between the glasses (also possible with a spoon) and put the glasses in the freezer for at least 2 hours.
8. Whip the remaining 100 grams of double cream making sure it's not too stiff.
9. Bring to taste with powdered sugar.
10. Scoop the whipped cream into the frozen parfait.
11. Put a few blueberries on top of it and, using a knife, scrape some chocolate from the pure and white chocolate bar and put it on top of the parfait.

# Ice Skating

Even though the snow hadn't fallen yet, the ice was still ready when we went ice skating. From beginners, who looked like grandmothers on the ice, to experts who had obviously done it quite some times before, everyone was welcome and had a great time. Between the rounds of ice skating there was time for hot chocolate (often with a bit of Baileys) or some warm glühwein. Despite the glühwein the number of casualties stayed very low. After the ice skating the Ma van Sloun was open for some warming up.



# Upcoming Events

## *January 11<sup>th</sup> Semi-Annual GMA*

As we are almost halfway the academic year and therefore also our board year, it's a good time of evaluation. All of you are invited to come and we hope to see lots of you there!

## *January 25<sup>th</sup> - January 29<sup>th</sup> Business Trip*

In the last week of January Vectum's yearly Business Trip will take place. We will visit several companies in the area of Amsterdam and work on interesting cases.

## *February 2<sup>nd</sup> LED*

On the 2<sup>nd</sup> of February the LED, Landelijke Econometristendag, will take place in Rotterdam. This is the largest annual recruitment event for Econometric students and gives you the opportunity to get in contact with many companies. More information can be found on the website of the LED ([www.leditbeyourday.nl](http://www.leditbeyourday.nl))

## *February 16<sup>th</sup> Master Information Evening and Music Quiz*

As time goes by fast, you might be thinking about which master you would like to do. During the master information evening, you will get information about the different masters you could do after your bachelor. Afterwards we would like to invite you to test your music knowledge!

## *February 23<sup>rd</sup> Bowling*

Let's have a fun night bowling and try to beat everyone with your strikes!

## *March 1<sup>st</sup> Beer and Wine Tasting*

During the beer and wine tasting you get the possibility to taste all kinds of special wines and beers.

## *March 8<sup>th</sup> Research Lecture*

The research lecture this period will be given by Anago.

## *March 10<sup>th</sup> LaTeX Workshop*

This workshop, organized together with SCOPE | Economics, will get you familiar with LaTeX, a software often used for bachelor and master thesis as well for academic papers.

## *March 17<sup>th</sup> Squash*

Let's end the period in a sportive way! During our last activity we will play a squash tournament at the squash center in Maastricht!

## *April 2<sup>nd</sup> - April 9<sup>th</sup> Ski Trip*

This year we are organising the first ever ski trip! If you are still interested in joining and haven't yet subscribed get in contact with a board member and we'll add you to the waiting list.



**The Board of 2015-2016  
wishes you all a Merry  
Christmas and a wonderful  
2016!**

