2 - 2013/2014

Per Vectum

magazine of study association

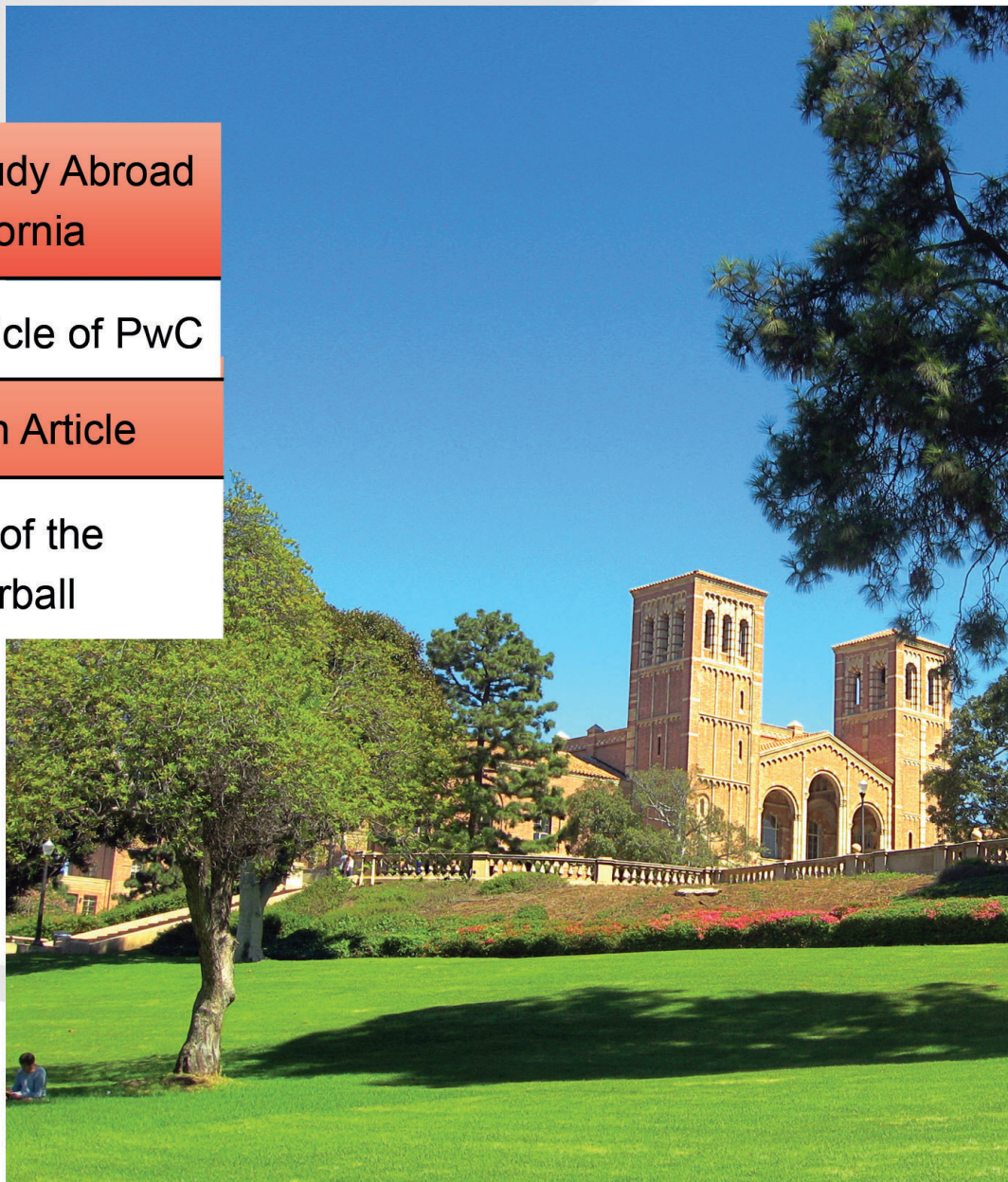
SCOPE | Vectum

Michael's Study Abroad in California

Company Article of PwC

Research Article

Report of the Winterball



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School of Business and Economics

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Landelijke Econometristendag

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Word from the President

Dear Econometricians,

We have survived the apocalypse predicted by the Mayas for almost a year, and after almost four months of straight hard work and studying the year 2013 is coming to an end we are looking forward to several weeks of Christmas holiday. During this holiday we hope that everybody can relax and celebrate Christmas and New Year with friends and family, and hope to see all of you back in January with renewed strength. We hope to give you an interesting read for during the holiday with this second edition of the PerVectum for the academic year 2013-2014.

For us as a board this second PerVectum does not only mark a midpoint in our study year, but it also implies that the first half year of our board year is almost over. To present our achievements of the last half year I would like to seize this opportunity to invite you all to our semi-annual GMA on January 15th.

For all of our students the end of the second semester marks an important point in their studies. The first year students have almost completed the first half year of their bachelor. They have struggled with the intermediate exams of Linear Algebra and Analysis and with the Orientation exercises. An extra motivation for the first year students is that if you are capable to survive the first half year, you will be able to pass the rest of your courses in the bachelor. After this first semester most of the first year students will have a clear indication whether or not the required BSA can be attained. Next to this it is important that our first year students position themselves well for the study abroad ranking next summer. As board we hope that our first year students have been enjoying the first few months of their study, something I hope SCOPE |Vectum was also

able to assist you a little bit in. Our second year students have recently found out at which university they will be staying for their study abroad. We hope that all of you ended up with the place you wanted to go to. From my own experience, and from the stories I heard from other students, I can tell you that whatever place this may be I am sure you will have a great experience which you will never forget. In contrast with our second year students, our third year students are coming back from their exchange destination. We would love to hear all your great stories and hope to see you at some activities next semester. Our master students are reaching the end of their academic career and are exploring the opportunities which lie ahead.

The first two block of this year were demanding for all of us. As there was no single day off in-between the first two blocks, I am sure some of you, just like me, could have used some distraction from studying time to time. I hope that we as board helped with this by organizing several activities the last two blocks. The first Tuesday of the semester we started traditionally with a research lecture. We invited Phd student Marc Schröder to talk about his research, "the estate division problems". We would like to thank Marc for his lecture which was very clear and understandable for everyone. After the research lecture we had the SCOPE block opening party which had the theme "Harry Potter Halloween". I can tell you that our treasurer, Ellissa, was very happy with this theme; she transformed herself in a Hermione Granger double. In the second week we had the Pub Quiz organised by Inge and Quintin. We would like to thank and congratulate Inge and Quintin for making a modern and entertaining Pub Quiz. If you two cannot find a job after your studies, you can always become a Pub Quiz master duo. The week after, we had a Karaoke evening in the Preuverij. Our students and other "pub goers" entertained us and the rest of the bar with their singing skills. Unfortunately we could not identify a new voice of SCOPE | Vectum that evening, so Sean is still our best singer. In the fourth week we had a cycling dinner where several students showed that they have the potential to become the next Jamie Oliver. The onion soup, the famous "zuurvlees" and the pig pie where seen as the best dishes of the evening and could be served at a Michelin star restaurant according to our students. In week five we had the already legendary SCOPE Winterball. I want to compliment all of our students with their posh clothing choice. Especially Celine looked nice in her handmade red dress, which travelled halfway around the world before it arrived in Maastricht just in

time. One week later we went ice skating at the Vrijthof. The Vrijthof was transformed into winter wonderland which created a romantic and cosy atmosphere. During and after the ice skating we warmed ourselves with glühwein and hot chocolate.

After looking back at the last half year we also need to look forward. At the end of January we will organize a Business Trip. In this way we hope to facilitate the students in the last years of their study with the opportunity to get familiar with potential future employers. On the 11th of February. the LED (Landelijke Econometristen Dag) will take place. The location will be the beautiful NBC in Nieuwegein. The subscriptions will open on the 17th of December. Do not forget to subscribe as you should have experienced this event at least once in your life as en econometrician. Both these events will enrich your insights in career possibilities and will also bring a considerable amount of fun, so we hope to see many of you at both events.

In this second edition of the PerVectum, you can find articles about the SCOPE | Vectum activities in the second block. Furthermore, there will be a research article written by Maria Zumbuehl, Thomas Dohmen and Gerard Pfann about the risk preferences of parents and children. Next to this we will have an interesting interview with Dries Vermeulen. PwC provided us with an article about bringing mathematics in the board room. On top of that Michael Pollmann will tell us about his great experiences in California.

On behalf of the SCOPE | Vectum board 2013-2014, I would like to wish you all a merry Christmas and a successful 2014. Enjoy your Holidays and we hope to see all of you back at our activities in 2014.

Jim Bemelen
SCOPE | Vectum President 2013-2014

PerVectum

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Cycling Dinner

by Frederique van Leeuwen

Tuesday the 19th of November, it promised to be a tough day with a lot of orientation and skills. As we already expected, it was not the most exciting day of our life. Therefore, we were as happy as hell that Scope|Vectum organised a walking dinner: we didn't have to cook for ourselves after such a 'wonderful' day at the SBE.

The expectations were very high, so there was a lot of pressure on the cooks. To satisfy all the starving econometricians, the cooks spent their whole day, or even week, on cooking, which resulted in something delightful. At seven O'clock, we were welcome at house number 1, where we started with a delicious courgette-soup (known as the speciality of Celine, which is suitable for every moment of the day). Unfortunately, we were not able to eat the soup all night long, due to the time schedule that had been made.

It was of course hard to say goodbye, but the welcome committee of house 2 made us forget that. Even though it looked not so appealing what they had made (something brown with little pieces in it), it was delicious! We all ate way too much of it, and after we heard about the ingredients, we all doubted our initial enthusiasm. Of course, this doubt washed away instantly, when we thought of how much we enjoyed eating it. It was a very nice main course, which asked for a lot of effort, what consequently resulted into a little time-scheduling problem. But as easy as it is, we just texted around about this little time issue and everything was solved.

Time for the next and final destination: house number 3. When we entered the house, the desert was already waiting for us: a brownie with ice-cream. Even though it was almost too hard to find any space left in our stomachs, it was still very welcome. Very satisfied about the high level dinner made by some amazing master student cooks, it was time for a good party in "the Preuv" to finish a wonderful evening!

The Secret Recipes

Celine's famous Courgette soup

Slice 2 courgettes in half-round slices.
Heat the oil in a frying pan and saute some garlic over medium heat for about 1 minute. Add the courgette and let it simmer for a while. Season with salt and pepper.
Boil 1 liter of water and add the bouillon cubes (preferable beef cubes). add the courgette when the water is boiling. Let it simmer for about 10-15 minutes.
Blend in the blender/processor till smooth.
Serve with a touch of love. Enjoy!

Florentijn's delicious "Zuurvlees"

Cut 1 kilo of stewing beef in small pieces. Heat some butter, and add the beef to this, until it is cooked well done.
Cut 4 onions in small pieces and add it to the beef.
Take 3 slices of typical dutch"ontbijtkoek", crumble it and add it together with 1 bottle of dark beer, 1 spoon of applesyrup, 2 cups of beef bouillon, 3 bay leaves and 6 cloves to the casserol.
Close the casserol and let it slowly boil on low fire for 2.5 hour.
Make sure you keep stirring your lovely stew pot.
Enjoy your typically hometown meal!

Jim's easy but delicious dessert.

If you want to have a delicious dessert and you don't have much time to prepare this is the perfect last course of your menu.
Bake some brownies. You can use any recipe you have learned from your grandma to make brownies or you can buy a complete mix for brownies of any brand you like.
In the meanwhile that these brownies are baking you have to get the best ice cream in the world. You have to go to a specialised ice cream vendor and buy traditionally handcrafted ice cream in flavours vanilla and whipped cream.
Serve the brownies and the ice cream.
Enjoy your delicious but simple dessert!

Impressions from **Cycling Dinner**

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Can Parents Shape Risk and Trust Attitudes of their Children?

By Maria Zumbuehl, Thomas Dohmen, and Gerard Pfann

We compare parents and their children and find that risk preferences and trust are more similar between children and parents that are more involved in the upbringing of their children. This outcome may help getting a better understanding of social mobility across generations.

Mounting evidence in economics, psychology and sociology literature indicates that preferences, attitudes and personality traits are transmitted from parents to children. The transmission of preferences, attitudes and other non-cognitive skills is expected to contribute to the intergenerational correlation in economic outcomes such as income and schooling. As social mobility is of prime interest for society, social scientists need to better understand the channels through which non-cognitive skills are transmitted from parents to children. Of particular concern for policy makers is the role of nurture in the formation of preferences. But very little is known about the channels through which socialization affects preference formation. An unanswered question is whether there is a technology for parents to shape children's preferences by purposeful investments.

In a sample of about 2000 parents-child triplets (from the German Socio-Economic Panel Study, GSOEP) we find that parents who engage in certain activities have children that are more like them in terms of economic preferences. This indicates that a technology for shaping preferences exists and that there is scope to shape children's preferences by purposeful investments. This does not mean that all the parents who invest in their children do so to exploit this technology, but rather that they could purposefully shape the preferences of their child, if they wanted to.

The type of investment that we consider relates to parental involvement, which measures how frequently parents have engaged in certain activities in direct interaction with their children, as in talking about the child's life and worries, and proxies that measure how much the parents were involved with their children's educational development. Our construct of activities thus captures a very general investment strategy. However, our measure of parental involvement as an investment variable is far from comprehensive, and many facets of investment are not

captured. Thus our results should be considered a lower bound and an estimate of the importance of investments in the transmission mechanism.
The willingness to take risk and to trust strangers have been shown to play an important role in economic decision making. Risk attitudes have an impact not only on financial decision making but also on other realms of a person's life, such as choice of education and occupation or health matters (Dohmen et al., 2011). Also the willingness to trust strangers has an impact on economic success. Guiso et al. (2008) document that trust toward strangers is important for the development of impersonal markets and the well-functioning of political systems, while Butler et al. (2009) show that trust and trustworthiness influence personal income. Both attitudes have been shown to be transmitted from parents to their children (Dohmen et al. 2012).

In our sample individuals' trust and risk attitudes are measured by experimentally validated survey questions. Both parents and their children respond to the same questions. One questions asks respondents to rate their willingness to take risks in general, using a scale thatranges from zero, which denotes not willing to take risks at all, to ten, which stands for very willing to take risks. This question is experimentally validated in the study by Dohmen et al. (2011), which also documents that the answer to the general risk question is a good predictor for a number of risky decisions. The general risk question was asked in six waves of the GSOEP.

The measure of trust attitudes combines three survey questions into an aggregated trust index. In two waves of the GSOEP the respondents were asked how strongly they agreed with the following three statements on a scale from one to four, where one means “Agree completely" and four means “Disagree completely": “On the whole one can trust people", “Nowadays one can't rely on anyone", and “If one is dealing with strangers, it is better to be careful before one can trust them." We use a simple average over the three trust measures as our trust index. Fehr et al. (2003) validate this trust measure by showing that trust in strangers, measured by the three above-mentioned questions, indeed predicts first mover behavior in a trust game.

Since the focus of this investigation is on the transmission of preferences and not on the level of those, the main variables of interest are the difference in preferences between a parent and their child. The four dependent variables (difference in risk, or trust respectively, between mother and child and between father and child) are measured as the absolute difference in the respective preference between the par-

ent and the child, standardized across the sample. The preference measures are constructed using information from the first wave in which the entire parents-child answered the respective survey questions. The dataset is described in more details in Zumbuehl et al. (2013).

We are interested in whether parental investments, broadly defined, influence the transmission of economic preferences and attitudes. We focus on parental effort in the upbringing of children as parental investments. This includes, on the one hand, how much parents are involved in their children's school situation, which is an important part of a child's daily life, and, on the other hand, how strongly the parent participates in the child's life and how much the parent involves the child in family matters.

The youth questionnaire of the GSOEP provides proxies for the investment that we are interested in. The proxies summarized in figure 1 measure how involved parents are in their children's school situation, how much parents participate in the life of their children, and how strongly they integrate their children in decision processes. All the proxies are measured either as binary variables or on a four- or five-point scale. Most of the school-related proxies are measured on an aggregate level for both parents together, while for other proxies we can distinguish between the efforts of mothers and fathers. Together, these 13 proxies provide insight into the general investments of parents in their children's upbringing. However, there are many more possible investments that we cannot address in this study, such as the choice of residential neighborhood or joint leisure activities. We assume that all the proxy variables measure parental investment, but none of them measures it perfectly. We combine the proxies in an index to measure the underlying true parental investment using a method proposed by Lubotsky and Wittenberg (2006).

Table 1

	Risk		Trust	
	Δ^{MC}_{R}	Δ^{FC}_{R}	Δ^{MC}_{T}	Δ^{FC}_{T}
	(1)	(2)	(3)	(4)
Investment Mother	-0.091***		-0.085***	
	(0.019)		(0.023)	
Investment Father		-0.096***		-0.093***
		(0.020)		(0.021)
Observations	2187	2178	1466	1466
R-squared	0.082	0.027	0.028	0.089

Note at table 1: The dependent variables are the standardized difference in risk attitudes between mother and child and father and child in Columns(1-2) and the standardized difference in trust attitudes between mother and child and father and child in Columns(3-4). The variables "Investment mother" and "Investment father" are constructed as a weighted average of the 13 proxy variables of the parent's investments. Other controls include: No. of kids in family, year of birth, gender, household income, mother's years of education, father's years of education, migration background, age difference between child and parents, the heterogeneity within parents in the respective attitude and year of the attitude elicitation. Clustered, robust standard error in parentheses. * significant at 10%; ** significant at 5%;
*** significant at 1%.

Transmission technology

There is a significant link between how much parents invest and how similar their children are to them with respect to risk and trust attitudes. Table 1 reports this relation, controlling for family characteristics and demographic and socio-economic variables. We find a negative relation between parental investment and the difference in attitudes, or in other words that parents who invest more in their children are more similar to them. For risk attitudes for example, a one standard deviation increase in investment by the mother is related to a 0.091 standard deviation increase in similarity. Hence, mothers who are in the 95th percentile of investing are almost 0.6 points (on the risk scale from 0 to 10) more similar to their children than mothers who are at the 5th percentile of investment. Comparing this effect to the gender difference in risk attitudes (which amounts to 0.664 in our sample) it becomes evident that the effect is not only statistically but also economically relevant.

We find a similar relation of investment and similarity in willingness to take risks between fathers and their children. Also looking at the similarity between parents and their children with respect to trusting strangers we find that parents who invest more in the upbringing of their children have children that are more similar to them. These findings do support the possibility that there is scope for parents to influence their children's economic preferences and attitudes by being more involved in the child's life.

Conclusion

Investigating whether parents are equipped with a technology that would allow them to deliberately shape the preferences of their children we find that parents who invest more effort by being more involved in the lives of their children have children who are more similar to them. This holds for mothers and fathers and for both risk and trust attitudes.

Having shown that a mechanism exists which enables parents to affect the transmission of preferences by investments, such as parental involvement, indicates that preferences are mallea-

ble during childhood and can be purposefully shaped. As it is very likely that other investment opportunities, beyond the ones documented in this paper (e.g. the choice of neighborhood in which the child grows up) exist, which allow parents to directly or indirectly affect their children's attitudes, beliefs, and preferences, we interpret our findings as a lower bound for the effect of parental investments on the intergenerational transmission of risk and trust attitudes.

While the malleability of preferences suggests scope for policy intervention, we deliberately have not indicated whether policy makers should aim at affecting preference formation, and if so in what directions. In fact, it is not obvious what bundles of preferences are superior in different conditions, and we want to caution policy makers to jump to conclusions too quickly.

More generally, our findings provide evidence that socialization is crucial for the transmission of preferences from one generation to the next. This result is of great consequence for our understanding of intergenerational mobility and for the design and appraisal of policies that affect social mobility.

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SCOPE Winterball

by Inge Klaassen

After a lot of meetings, organization and a hunt for fireproof decorations, the tickets for the Winterball were sold out in just two days! And then…it was finally the day of the 'Golden Twenties' Scope Winterball 2013!

We started off with a dinner at the Italian restaurant "Cucina 50" with SCOPE | Vectum, where everyone could show off their dresses and suits (and Jim his Italian mob boss look), all in the theme of the ball: 'The Golden Twenties'. After the dinner, it was time for Ellissa and me to go to the Hotel de l'Empereur for some last minute preparations and decorations. We decorated the venue with Christmas trees and golden garlands and had a last minute briefing.

Then there was nothing left to do for us but to start the party and wait for the first guests to arrive. The first arriving guests received a nice bubbling glass of Prosecco at the entrance and everyone could get their pictures taken together. Everyone was dressed in outfits from the twenties: dresses with pearl necklaces and a lot of feathers and neat suits with (occasionally) suspenders. As the guests arrived, the band, the Shakers, started playing. They played a mix of soul and jazzy, especially older, songs, on a variety of instruments, like the saxophone, trumpet, guitar etc. Their music fitted the theme really well. Everyone could sing along with songs like 'Hit the road, Jack' and 'I feel good' and a crowd formed around the stage, dancing and singing along with the band. During the break, DJ 2 F'in Good gave us a taste of what was to come the rest of the night. Then the Shakers continued and played until the new day had already almost begun. The great musicians and amazing singer, Janneke Meessen, gave us a fantastic performance! The DJ continued together with saxophone player Raphael Mankopf. People danced, drank and sang and they kept going until it was already time to end the party.

All in all, it was a great party with thanks to the band, the DJ, Raphael and all the enthusiastic guests. Thank you all for coming and hopefully until next year!

SCOPE Winterball








Econometric modelling for Strategic Workforce Planning

Bringing mathematics in the boardroom

By PwC
by: Jacques de Swart, Lau Akkermans and Linda Vos

Jacques de Swart and Lau Akkermans work in the Quantitative Analysis (QA) group of PwC. This group, consisting of econometricians, mathematicians and physicists, focuses on the application of mathematics in business by modelling in its widest sense. Linda Vos works in the Pensions, Actuarial and Insurance Services (PAIS) department. This department mainly consists of econometricians and actuaries and their main activities are advising public and private companies, pension funds and insurers, both from an actuarial point of view and from a strategic, fiscal and legal perspective. Within PwC, Jacques, Lau and Linda combine their strengths in projects on the cutting edge of actuarial and quantitative analysis, such as strategic workforce modelling. Jacques, Lau and Linda wrote this article on their own title and it therefore does not necessarily represent the opinion of PwC.

Introduction

"How will my workforce be distributed over the different seniority levels in ten years? Will my company have to deal with redundant employees? How does the demographic aging affect my staff population? What kind of interventions will ensure that our average seniority level increases?"

These are just a few of the questions that might keep a Human Resource (HR) manager awake at night. And many organizations are keen to know the answers to these questions. But how to quantify staff flows? How to quantify the impact of possible management interventions? A workforce optimization model could support in HR executive decisions on strategic workforce planning. We built a model to answer the questions raised above, The Business Simulator.

Due to, amongst others, the difficult economic climate and aging of the population, workforce prediction modelling is becoming a hot topic, especially for organizations with large, comprehensive workforces. These organizations wish to quantify their HR strategy, but generally do not have technically trained employees to substantiate and quantify the desired future solidly. Looking into the HR software market we found to our surprise that most software developers only build static models with less focus on modelling staff flows. Therefore we decided to develop our own dynamic workforce optimization model.

In this paper we will define how we distinguish three types of staff flows in The Business Simulator: inflow, throughput and output. Once these types are determined, we will elaborate more on how these can be modeled and what objective function will optimize a desired future workforce.

Mathematical models in a Human Resources context

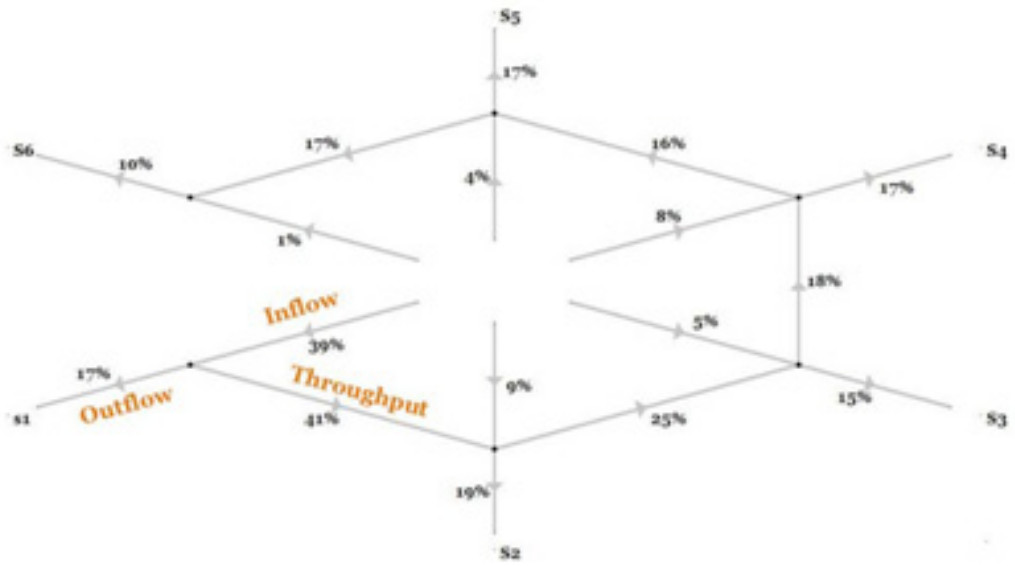
The simplest form of a workforce modelling system treats the modelling of a group of people having the same job. The size of the group changes due to recruitment and outflow. More complex systems incorporate a set of different function levels and enable the modelling of a flow of promotions.

In this article we will incorporate the workforce flows for a company having six different function levels and recruiting mainly people from university. This can be seen as a common and general business model for amongst others banks, insurance companies, governmental organizations and hospitals. The generic function levels are named: S1, till S6. As modelling environment we decided to use AIMMS, since this is a very powerful language in visualizing data flows in networks while it also is a broadly recognized optimization package.

Figure 1 shows the flows of a workforce having the six function levels, for a given year. It is created as a circular network graph, using nodes and arcs to visualize the flows from and to function levels. The black nodes are defined as the function levels. In addition, the displayed percentages show the proportion of inflow, throughput (promotion) and outflow.

In- and outflow probabilities can be easily defined by taking the proportion of in- and outflow of total employers. The promotion scheme is usually presented by a throughput matrix. Several historical career paths and the capability framework in the career model were studied in obtaining realistic throughput probability values.

Figure 1 Example of workforce flows for a company with six function levels for a given year



Desirable workforce composition

Besides the historical workforce flows, we need to specify suitable ratios per
function level to build effective teams. By using these ratios we can fill in the seniority degree of freedom, i.e. we can determine the appropriate seniority level of new joiners. Another way of looking at these desirable staff ratios is viewing these as a desirable population pyramid for the staff.
We will elaborate on the other input variables for The Business Simulator after we have explained how the optimization engine of this model works.

From the Mehlmann model to The Business Simulator

To give a flavour of how these models from literature look like, we describe a representative model designed by Mehlmann. It uses dynamic programming - in which every decision influences future decisions - to determine optimal promotion schemes and recruiting targets (Mehlmann, 1980). The set of decision problems consists of deciding on promotions and inflow every year, such that the deviation from a desirable workforce structure is as small as possible.

Although the Mehlmann model offers good insight in the principles of manpower planning models, we cannot use this model for our purposes due to two reasons. First, the model only focuses on the structure of resource pools and does not take into account

the available staffing budget. Second, the model needs the future total sizes of resource pools as input parameters, whereas we would like our model to consider these as output parameters.

The first conclusion from studying the Mehlmann model is that we can keep the model quite simple by treating the promotion scheme as a fixed input parameter (rather than as decision variables), and the inflow at different function levels as the only decision variable. Furthermore, a shift in emphasis is necessary to fit the particular model needs. Unlike Mehlmann, we also want to exploit predictions about future staffing costs. Therefore we combined those basic principles into a new PwC model, The Business Simulator. Our model is summarized in Figure 2.

At the left we have all input parameters. We listed these parameters in decreasing order of influence the decision maker (i.e. the HR manager) has to determine them. The current staff is given and an organization hardly has influence on the costs of the workforce. Outflow and promotions start to become easier to influence and the organization at stake is totally free to choose the desirable workforce composition and to predict what future budget they will spend on their workforce.

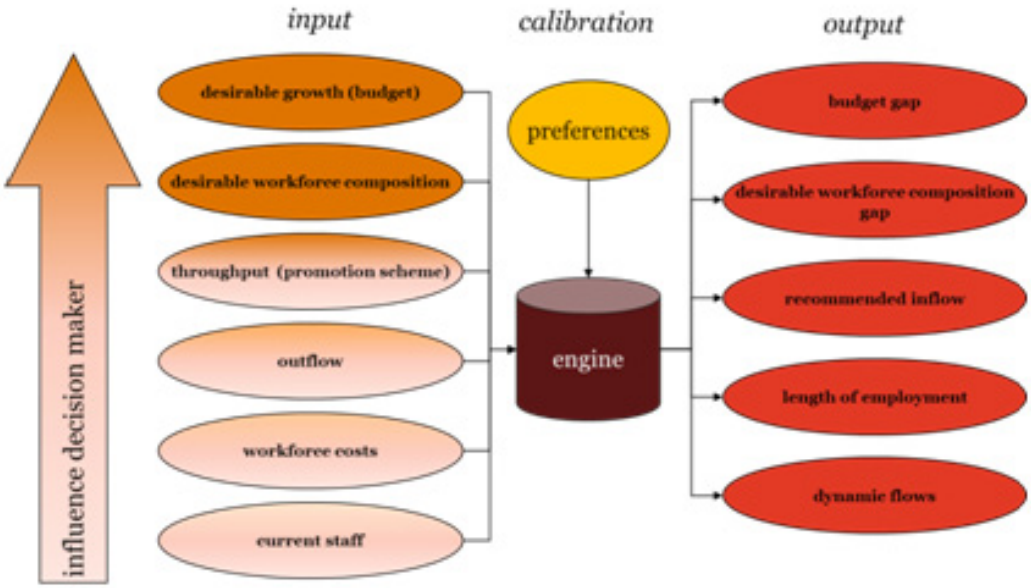
Before we run the model to compute outputs, we can set our preferences. Regarding these preferences, one can think of the calibration method or the number of years to predict. The most important outputs are the budget gap, the desirable workforce composition gap and the recommended inflow. The first is the difference between the future budget and the amount computed by the model to spend by the organization on their workforce. The second gap is the deviation per function level between the desired number of FTE and the actual number computed by the model. Having the outflow and the throughput per function level, the model determines the recommended inflow per year and per function level. Based on this output the organization can build its recruitment strategy.

Next to these three outputs, we also want to track the resulting average length of employment. This can support in the quantification of social plans, in which the length of employment is an important factor to decide whether or not an employee can stay. Finally, we want to be able to follow the dynamics of various flows of resources.

Creating impact in a boardroom setting

In our opinion one of the essential characteristics of any type of model

Figure 2 Structure of The Business Simulator



is the capability to be suited to many different circumstances, which cannot be predicted precisely beforehand. Examples are the introduction of new function levels and unemployment. As people started to build tools that could help to define actions in such occasions, two classes of models started to evolve: Explanatory models and normative models.

Explanatory models are limited to yield insight in how the current workforce policy works and how it would react to certain stimuli. These models range from very simple models that can be used by almost any type of organization, to very elaborate complex stochastic simulation models for the study of specific types of HR flows.
Normative models - sometimes also called binding models - are more powerful in the sense that they can compute a set of optimal decisions, given a set of objectives and predictions about changing circumstances. The set of objectives is normally translated into one value by using an object function. Within the set of normative models, a distinction can be made between models that make use of object functions with or without targets. Without targets, the normative model would for example compute a set of decisions that maximize profit, or minimize outflow. An example of a normative model with a target is the attempt to arrive at a pre-set leverage of senior employees.
One important thing to realize as a model developer is not to forget the ultimate goal of the model. In case of

The Business Simulator the final model will be used to support HR managers and directors making more solid policy by showing the quantified impact of their decisions. This implies the model builder should also spend enough time in the design of the output and, more common, on the user-friendliness. Of course, the algorithm should be right as well, but that is the basic expertise and knowledge you might expect from an analytical consultant..

In conclusion, we see building quantitative models as an iterative process in which the client is strongly involved. The model should be able to anticipate quickly on questions uprising in demo presentations. Consequently, the modeller needs to have a grasp of storytelling: "A new kind of professional has emerged, the data scientist, who combines the skills of software programmer, statistician and storyteller/artist to extract the nuggets of gold hidden under mountains of data" (The Economist, 2010).

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2. "Data, data everywhere", an interview with Kenneth Cukier. The Economist (February, 2010)

If you have any questions regarding this article or if you would like to have more information about working at PwC, please contact Evi van Splunder by email (evi.van.splunder@nl.pwc.com) or by phone (06 12 83 17 35).

Impressions from **Indoor Climbing**

Impressions from **Karaoke**

Impressions from **Pubquiz**

Je kunt als bedrijf nog zo veel willen, je krijgt pas wat voor elkaar met goede mensen

KPMG biedt accountancy- en adviesdiensten aan uiteenlopende organisaties. Van controle- en adviesopdrachten aan (beursgenoteerde) multinationals tot de nationale of regionale 'middenmarkt' die onze totale dienstverlening inschakelt. Het spectrum is breed, de uitdagingen talrijk.

Alleen al in Nederland hebben we 3.200 medewerkers, verdeeld over 13 kantoren. We zijn voortdurend op zoek naar talentvolle mensen met dezelfde passie. Mensen die gedreven en betrokken zijn en het beste uit zichzelf willen halen door heel goed samen te werken. Zit jij zo in elkaar? Dan wordt het tijd om kennis te maken.

Aan de slag als accountant

Bij KPMG Audit start je na je universitaire studie of hbo-opleiding als trainee. Je gaat direct aan de slag bij alle soorten klanten. Tegelijk volg je een opleiding tot registeraccountant. Daarna ben je gekwalificeerd registeraccountant en beëdigd om de financiële rapportage van ondernemingen te verzorgen.

Of als adviseur

Bij KPMG Advisory begin je als junior adviseur en start je direct met adviesopdrachten. Je volgt ook doelgerichte opleidingen. Afhankelijk van je universitaire studie en interesse kun je kiezen uit verschillende richtingen. Van organisatieadvies tot fusies en overnames en van het kwantificeren van complexe risico's tot IT-advies.

Waar je ook voor gaat: kansen genoeg om samen met je collega's aan iets moois te bouwen.

Meer informatie

Ga naar www.kpmg.com/nl/starten of maak een afspraak met het KPMG Recruitment Centre (020) 656 7162 of mail naar recruitment@kpmg.nl

KPMG
cutting through complexity

Puzzle

Family Occasion

‘It was a wonderful party,’ said Lucilla to her friend Harriet.
‘Who was there?’
‘Well – there was one grandfather, one grandmother, two fathers, two mothers, four children, three grandchildren, one brother, two sisters, two sons, two daughters, one father-in-law, one mother-in-law and one daughter-in-law.’
‘Wow! Twenty-three people!’
‘No, it was less than that. A lot less.’
What is the smallest size of party that is consistent with Lucilla’s description?

Solution to the Puzzle

PerVectum issue 1, 2013-2014

Meet the Professor
Dries Vermeulen

by Kaya Verbooy and Laurens Snijer

The statistics:

- Birth date: August 5th 1965
- Birth place: Oosterhout, Brabant (near Breda), the Netherlands
- Number of papers: over 40
- Ride: Peugeot 206
- Favorite color: no particular color
- Favorite animal: cat
- Favorite theorem: the one from Brouwer – yes, you know this one!
- Favorite tv-show: I don't really have one, I do enjoy an episode of the big Bang theory once in a while when it happens to be on TV
- Favorite restaurant: this Indonesian restaurant, on the corner across the street from the Pathé
- Favorite tea: flower tea from Iran

At the end of the hallway of the third floor we find a small office with lots of books, a whiteboard with numbers and in the background some incoherent sounds – mainly scales and etudes. The familiar setting for the SBE professors and the natural habitat of our subject of interest. If you study econometrics at the University of Maastricht you will certainly meet him at some point in your academic career: our professor in Game Theory Dries Vermeulen. He is involved in Analysis I, Game Theory, Auctions and Electronic Markets and Game Theory and Optimization. Not to forget; he is the coordinator of our master program.

For all of you who have not googled him and read his wonderful resume here is a short summary. After high school our professor considered a study in molecular biology but then found the study mathematics in Nijme-

gen through his fellow classmates and decided it was a better fit. He enjoyed his study and Nijmegen for six years before graduating and does not regret his decision even if he could choose from the new, large range of studies that universities offer nowadays. After his time as a student, professor Vermeulen choose to do a replacement for the obligatory military service after which he returned to Nijmegen for a PhD in Game Theory.

When we ask him who his Mathematical Idol is he answers decisively: "Van Neumann". This mathematician has done many unique things: "It is very rare, he has been working in the fields of quantum physics, computer science, game theory, numerical analysis and logics. He has done so many research in different areas, I couldn't do that. It is something I really respect."

There are some subjects he would like to research himself, but hasn't found the time yet to do so. "Computation of the Nash Equilibrium, which is an operations research topic." He tells us: "It's a popular subject but quit technical and one has to do a lot of reading and preparation before researching it." He is also interested in complexity theory applied to game theory as has been researched by Christos Papadimitriou – a professor at Berkeley you might know from the 'Logicomix' books.

With all this talk about the future and unexplored fields of interest we wonder what topics are occupying the professor nowadays. "My PhD thesis was about the stability of the Nash Equilibrium. In my current work I am researching other applications of game theory; auction design and industrial organization. I also try to be involved in other research that is less theoretical. For example the refinements and structure of the Nash Equilibrium set." After all this seriousness we would also like to know the truly interesting things – yes, professors have a life as well. So what would professor Vermeulen do with a million euro's? "Buy a second house; living of the rent of money would be boring. I also would like to spend the money on vacations and enjoying it." Which brings us to the next topic: the bucket list. "Yes, a lot of things are still on it." He takes a deep breath, thinks – here comes the list - and then tells us that he still wants to go to San Markant. As we come from the internet generation our knowledge of geography is reduced to the skill to use googlemaps - "It's in Uzbekistan," he explains to us "It is a city halfway the silk route from Europe to China. I've already visited Chinese, Indian and Turkish parts of the route but never the part that lies in Uzbekistan. I've also been to Iran last summer and promised to go back one day, so that is also still on the list." A

true world traveler, but very happy in the Netherlands, when we ask whether he would consider living somewhere abroad he immediately says no; ”I would love to travel some more, but moving abroad is a big step. You leave so much behind if you live abroad permanently.” However, he did consider going abroad when he was at the beginning of his career. “There weren’t much opportunities in the Netherlands so I searched for jobs abroad. Then a spot opened in Maastricht, so I decided to move here.”

So besides work and traveling, we wonder what more he enjoys in live. “I made a promise to my drawing teacher from high school that I would keep practicing. I tried to keep that promise but haven’t been able to do so.” Recently he has started a drawing class in Amby; from doodling to painting, he is interested in many different techniques. Next to that he is also doing sports; darts, table soccer, biking and squash are on his list. And when not active drawing trees and fruits or throwing sharp arrows at a green board he enjoys a good game; from Bridge to Robo Rally.

As an established professor at the university with an academic career we would like to know what we have to do to succeed at university. Hence the question: Do you have any advice for the students? His reply is quite surprising: “Try to study hard, but don’t take it too serious.” So there you have it, no excuses to say no to parties. You can still succeed in life if you enjoy yourself outside of Casella and Berger. So does our professor has a motto in life? “No, not really. I just take life as it turns out.”

Impressions from **Research Lecture & Block Opening Party**

Study Abroad

Exchange Semester in California

by Michael Pollmann

More or less a year ago, when everyone found out where he or she was going, I still had to wait: going to California means applying to the different campuses of the UC system and hoping for the best. After having submitted my three choices, Berkeley, Los Angeles, and San Diego, it was still a long wait until late April to find out where exactly I would be going, while everyone else was already busy planning their trips. When I was finally told I was going to UCLA, I was slightly disappointed that I did not get my first choice, but spending a few months in Southern California was certainly not a bad prospect at all. It did, however, mean that my time in the U.S. would be rather limited: with only 10 weeks of courses from late September to early December and 30 days before and after, I certainly had a long summer while others were already writing about their travels (in Australia mostly).

With a short semester that promised to be rather busy course-wise, I decided to do some traveling "on my way" to LA, first stop: New York City. Never having been to New York, walking along the streets of Manhattan was

quite different from what I had seen during my stay with a host family in relatively rural Kansas. With about a week at my disposal, I managed to see most of the touristy sights. Personally, I especially enjoyed the amazing view from the Empire State Building, watching a musical on Broadway, Wicked, as well as spending some relaxing time in Central Park. The only disappointment here was the Statue of Liberty – I had always imagined it being larger.

After an exhausting week of walking around in always hot and sometimes humid NYC, I welcomed just sitting in a bus for a few hours on my way to Cambridge to visit my brother, while it was pouring outside – the last real rainfall I have seen. Staying for a week at my brother's apartment and spending time with his friends was a welcomed contrast to feeling like a tourist in New York. While I also walked along the "Freedom trail" visiting sites of the American Revolution, I particularly liked our nice BBQ with friends and seeing the Boston Red Sox beat the New York Yankees at Fenway Park for my birthday, and also going to a concert by Herbert Grönemeyer the night before flying to Los Angeles.

When I arrived on the campus of UCLA, I had it almost entirely to myself as most regular students moved in a couple of days later, giving the large housing area the feeling of a ghost town. During those first days, I needed to attend some information sessions for exchange students, which were, well, more informative than fun. It did, however, give me an opportunity to have a look around our campus, which is, in my opinion, really beautiful. While the area where all on-campus housing is (for about 20,000 students) is architecturally less impressive and more functional, leaving my residence hall in the morning and walking in the sunshine to one of our excellent dining halls to have breakfast reminds me of summer vacations at nice hotels – each and every day. As mentioned earlier, it never really rained (there were some drops of water coming down one day) and temperatures are around 25 - 30°

C (not F) in mid-November still. It just makes for a high quality of living.
Next to its good academic reputation, UCLA is known for the success of its athletics departments. Unfortunately, that meant that tickets for football games were sold out before I arrived. On a lucky day, however, the international center organized a nice evening event where I got to try on a jersey and other equipment (I have to admit that I do not quite pass as a football player) and talk to the coaches. Other sports are easier to attend; if I open my window I can listen to (if not quite see) soccer games. Even more fun was being in the student section of the basketball season opening, even though the actual game was rather boring – there seems to be little more energetic than college students' support for their team.

When I am not just opening the window to listen to soccer, my dorm room has little else to offer. Being smaller than my room in Maastricht and shared with two other students always makes it feel a little crowded, but I think living in a dorm is an integral part of the U.S. college experience and I would recommend it to almost everyone. UCLA offers many events during the orientation week, but UCLA does not really make efforts to help you to get to know people. Living on a floor with ninety other students is therefore great; it means that there is always someone around, and common floor activities make is easy to make friends.
As a result, with a few exceptions like people I met in class or on a bus sightseeing tour through LA, I spend most of my time with people from my floor, and they are the first ones for me to talk to about making trips on weekends. Unfortunately, it means that I have little contact to other exchange students (who probably also like to travel); but I also feel less like a temporary visitor, which I enjoy a lot. That being said, I definitely still want to travel, even though the 10 week course period, in which some of my courses even still write two midterm exams, is quite packed.

The sightseeing tour through LA was really nice, visiting among others the Walt Disney Concert Hall designed by Frank Gehry; the Hollywood Bowl, a semi-natural amphitheater; and, of course, also making a stop to look at the Walk of Fame, the Dolby Theatre where the Academy Awards are held each year, and the Hollywood sign in the far distance. It certainly is a fun place with lots of tourists trying to find their favorite star's star on the ground; people dressed like Spiderman, Transformers (not very convincing though), and Pirates (of the Caribbean, I assume), as well as singers and rappers trying to sell what might (but probably will not) be their breakthrough hits. This is certainly one of the must-sees of LA, just as driving through Beverly Hills hoping to see a movie star. The

open secret, however, is that chances are higher in Westwood, where UCLA is located and you might actually see someone shopping in a grocery store – while I have not recognized any stars, a friend met and talked to someone she had seen on TV (and whom I had never heard of).

Besides the Hollywood fun that is good for a day or two, my actual favorites have been the Getty Center and the Griffith Observatory, both situated in the hills in the North of LA with a great view of the city sprawling as far as you can see. The Getty is a good art museum that by itself is nice to look at and hosts a beautiful garden for people tired of looking at paintings. The Griffith is a small observatory turned science museum (ever seen a Tesla coil?) with amazing shows in its planetarium and opens its telescopes at night to the public to look at the stars. Beaches are also only half an hour away from campus, and a few weeks ago I met a friend from high school there who was on vacation in LA on a nice Saturday. Luckily I went swimming in the Pacific in September already; by now UCLA's own pools offer a more agreeable water temperature.

Luckily, I have at least two long weekends due to public holidays to travel a little further. Over Veteran's Day, I made a four hour drive to the Sequoia

National Park with a few friends, and it was definitely worth getting up in the middle of the night. We saw some of the largest trees on Earth, “climbed” a mountain for a fantastic view of the park, hiked through the forest, and had a brief snowball fight. On our long way back, I had plenty of time to think about my upcoming trips to San Diego, Las Vegas, Kansas to celebrate Christmas with my former host family, and Washington D.C. and Florida together with Coen. I cannot write about those future trips here, so I guess we will have to talk about all our trips and great times abroad after the next Vectum activity when we are all back in January. I am really looking forward to it!

You can read more about Michael's experiences on http://febastudyabroad-northamerica.wordpress.com/

Upcoming Events

Januari 15th Semi-Annual GMA

During this general members assembly, we will talk about the second half of 2013 and give an general overview of the current state of the association.

January 21st Active Members dinner

We invite our actives who help us in the committees for a nice dinner. Thank you very much; without you, SCOPE | Vectum would not be half as great!

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End of January Business Trip

In the week between block 3 and 4, we will go on our business trip. This year, we will visit several different companies for example in Amsterdam to show you who your future employers might be.

February 4th Research Lecture & Block Drink

After the carnival break, we will have our research lecture and block drink.This is a great opportunity to meet our 3rd years and hear of their great experiences abroad.

February 11th LED

The Landelijke Econometristendag 2013 will take place in Utrecht on February 5. During the LED, you will get to work on cases and get in touch with potential future employers before the day ends with a nice dinner and great party.

March 11th LaTeX workshop

If you need to write your thesis or a paper, this introductory workshop to LaTeX is right for you.

March 18th Surprise Activity

Dates may be subject to changes.
Please check www.scope-vectum.nl for updated information and subscription forms.