



INTERVIEW PREPARATION GUIDE

HBA1 students,

This is the *First Annual Case Interview Preparation Guide* created by the Ivey Management Consulting Club. Enclosed are 14 comprehensive cases and 5 pages of 'back of the envelope' math problems that you will find very useful. This package is particularly valuable because all of these cases were actually administered to Ivey students in the past several years in real interviews for both summer and full-time positions. Thus, these are the exact types of cases you can expect from consulting super-powers like BCG, Bain and Deloitte.

This document contains a great deal of wisdom. How much wisdom you ask? By comparison, Merlin would rate a 10 on the wisdom scale while Bono would rate a 7. The amount of wisdom contained in this study guide falls somewhere between the two. However, to harness the full amount of wisdom in this guide, you should consider the following:

- Simply reading the guide once through will not help you. For best results, practice these cases with a partner
- Memorizing a format based on these cases will not help you. A strong case interviewee is flexible and can understand what analysis is necessary based on the information provided during an interview... Don't be rigid!
- To ensure you are absorbing all of the learning benefits from studying, jot down your "key learning points" after each practice interview to note what tips you have picked up as you go along

We hope next year's executive will keep this tradition alive by adding even more cases based on the class of 2007's consulting interviews.

Best of luck with recruiting

2005/2006 Ivey Management Consulting Club

Table of Contents

Business Cases

1. Bain Consulting – Bicycle Store	3
2. BCG – Cardboard Boxes	4
3. BCG – DVD Retailer	5
4. Unknown – Bakery Shop	6
5. Deloitte – Mobile Virtual Network Operator	7
6. Bain – Payphones	8
7. BCG – Appliance Store	10
8. AT Kearney – Food Manufacturer	12
9. Unknown – Royal Bank of Scotland	14

Estimations

1. TELUS Mobility – Wall Advertising	16
2. Taddingstone – Mortgage Interest Payments	17
3. Taddingstone – Online Banking	18
4. Unknown - American Multi-Cinema (AMC) Theatres	19

Brain Teasers

1. Bain – 3:15	21
----------------	----

Math Calculations	22
-------------------	----

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	BAIN CONSULTING																												
Date/Context	Final Round Interview for Bain Summer Analyst Position																												
Issues Covered	Brainteaser ☐	Estimation ☐	Business Case X																										
Issue/Problem Posed	I own two bicycle and equipment stores in Thunder Bay. One is much more profitable than the other – what is the least profitable store doing wrong?																												
Information Provided	Both stores are in locations that offer equal opportunity																												
Solution	- Customer ‘traffic’ is equal in both stores, therefore conversion of customers into sales is the real problem - Work through the income statements for both of the stores early on in this case, and then determine what the numbers mean. This should reveal the ‘conversion’ problem - Determine that store #1 is generating fewer sales dollars because there are fewer people in the store to help with customers. In store #1, customers are leaving the store because the workers are so busy that they can’t help everyone. <table><tr><th rowspan="2">STORE</th><th colspan="2">Income Statement</th></tr><tr><th>#1</th><th>#2</th></tr><tr><td>Revenue</td><td>\$800,000</td><td>\$1,200,000</td></tr><tr><td>COGS</td><td>\$400,000</td><td>\$ 600,000</td></tr><tr><td>Expenses</td><td></td><td></td></tr><tr><td> Rent</td><td>\$100,000</td><td>\$ 150,000</td></tr><tr><td> Labour</td><td>\$100,000</td><td>\$ 200,000</td></tr><tr><td> Overhead</td><td>\$ 25,000</td><td>\$ 25,000</td></tr><tr><td>Net Income</td><td>\$175,000</td><td>\$ 225,000</td></tr></table>			STORE	Income Statement		#1	#2	Revenue	\$800,000	\$1,200,000	COGS	\$400,000	\$ 600,000	Expenses			Rent	\$100,000	\$ 150,000	Labour	\$100,000	\$ 200,000	Overhead	\$ 25,000	\$ 25,000	Net Income	\$175,000	\$ 225,000
STORE	Income Statement																												
	#1	#2																											
Revenue	\$800,000	\$1,200,000																											
COGS	\$400,000	\$ 600,000																											
Expenses																													
Rent	\$100,000	\$ 150,000																											
Labour	\$100,000	\$ 200,000																											
Overhead	\$ 25,000	\$ 25,000																											
Net Income	\$175,000	\$ 225,000																											
Other Helpful Hints	- The physical layouts of both of the stores are similar - There are fewer employees working in store #1																												

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	BOSTON CONSULTING GROUP
Date/Context	Final Round for Full Time Associate Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case ☒
Issue/Problem Posed	I am the CEO of Leishcorp, a manufacturer of cardboard boxes. My company has just acquired its main competitor, Colinco. Colinco also makes cardboard boxes. What type of analysis would you suggest we do moving forward.
Information Provided	• Our objective in this acquisition was to decrease fixed costs (transportation and factory overhead through closing some factories) • The merger will primarily affect our costs. Our main costs are: (raw materials – 15%, factory overhead and labour – 45%, and transportation – 40%) • Leishcorp's assets have a 60% utilization rate • Leishcorp has one factory in every US state. Colinco has factories directly beside Leishcorp factories in 20 states
Solution	• Industry analysis – both companies are profitable. Customers are becoming very powerful and are demanding shipping discounts. Suppliers are not powerful and raw material costs have stayed the same. • Break down revenues and costs – focus on costs to see where the benefits of the merger will come from. Revenues will not change – the same number of products will be sold at the same price. • Factory closures and shipping savings will be our 2 sources of savings. In cases where Leishcorp and Colinco have factories in the same locations, the Colinco factories can be closed. Leishcorp's trucks can accommodate production of both companies. EXTRA CHALLENGE: The main issue will now be determining which factories to close. Show the interviewee the below income statement and ask them for their advice. Tell the interviewee that Leishcorp produced 2,000,000 units and Colinco produced 1,000,000. If you want to provide a hint, ask the interviewee which factory yields the highest income per unit sold – this will be the factory you want to keep open.
Other Helpful Hints	

Exhibit 1

	Leishcorp-Alaska	Colinco-Alaska
Revenues	\$ 30,000,000	\$ 15,000,000
COGS	\$ 10,000,000	\$ 5,000,000
Gross Income	\$ 20,000,000	\$ 10,000,000
Overhead	\$ 4,000,000	\$ 2,000,000
Labour	\$ 10,000,000	\$ 6,000,000
Net Income	\$ 6,000,000	\$ 2,000,000

Source/The Firm	BOSTON CONSULTING GROUP
Date/Context	Final Round Interview for BCG Full Time Analyst Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	Your client (Faulton McGuinty Discount) owns a retail store. The main product that they sell is DVD players. In fact, it's the only product they sell where they actually make money – FMD only breaks even on the other products. We've noticed our market share decreasing recently. What's up?
Information Provided	- The market for DVD players is growing, but our share is decreasing - Market share has decreased from 40% to 30% over 5 years (show graph if asked about market share) - There are 3 competitors in the market - All of the three stores sell the exact same products - All of the competitors stores have the same physical layout and yield similar margins (see chart) - Urban and suburban stores yield similar profit margins
Solution	- The interviewee should identify that we are losing market share because competitors are opening new stores. They should then figure out how many new stores we must open to regain our market share (based on the exhibits provided - calculations should be done when interviewee is shown the graph and chart) - Competitors are opening new stores in cities where we currently compete – this is cutting into our sales and market share. Conversely, we have not opened any new stores in the last 5 years anywhere. - Have the interviewee determine market sizes based on the income statement (provided): - Initial market size (income) is \$50,000,000 2005 income market size is \$65,000,000 To regain a 40% market share of the new market (130 stores), we must open 12 additional stores ($130 * 40\%$)
Other Helpful Hints	Interviewer may have to lead the interviewee into the question of 'how many stores do we have to open to regain our market share?' aka – how many stores must we open to catch up to Mike Harris' income?

Exhibit 1

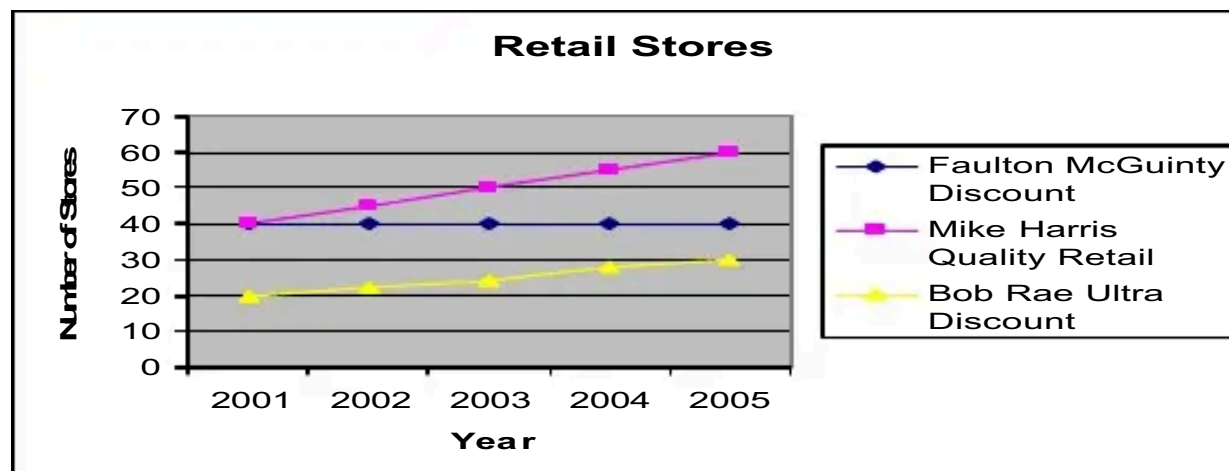


Exhibit 2

Retail Store Income Statement

Revenue	1,000,000
COGS	200,000
Expenses	300,000
Net Income	500,000

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	UNKNOWN
Date/Context	Final Interview for Summer Associate Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	Your client owns a bakery, but she is not happy with its performance. What should she do?
Information Provided	- The client has a specific objective – she wants to buy a new house (\$100,000) within 12 months. - Revenues and costs have stayed the same over the last few years for the bakery - The bakery makes one product – loaves of white bread - The bakery has a 50% asset utilization rate - White bread sells for \$.70/loaf, and brown would sell for \$.50/loaf
Solution	- The client must increase profits by \$100,000 this year: this can be done by increasing revenues and/or decreasing costs - Variable costs (flour, etc) cannot be decreased - Fixed costs (overhead) cannot be decreased - Revenues can potentially be increased several ways: - The bakery can introduce new products (since there is excess capacity. Have the interviewee work through some hypothetical numbers – ie: if we started selling brown bread, how much would we have to sell, and what else would you want to know before entering this market? Interviewee should consider competition, market size, synergies with existing business)
Other Helpful Hints	There is a great opportunity available to produce bread for Walmart. Ask the interviewee what they would want to know about this opportunity. They should determine the following: - Walmart is willing to pay \$.60 per loaf (normally the bakery charges \$.70) - The variable costs per loaf of bread are \$.40 - Walmart projects that they will purchase between 500,000 and 600,000 loaves next year.

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	DELOITTE CONSULTING
Date/Context	First Round Interview for Full Time Analyst Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	Your client is a mobile virtual network operator who is not achieving the necessary subscriber acquisition targets. They have asked Deloitte consulting to recommend a marketing strategy to turn things around.
Information Provided	A Mobile Virtual Network Operator is a cell phone company that doesn't have their own networks in place and leveraging existing networks from competing companies for a large fee.
Solution	<u>Market Place Acceptance Thus Far (Customers)</u> • Client price is aggressive • Client focuses on the prepaid arena whose consumers are primarily youth • Parents though typically make the purchases for their kids for safety reasons etc. – so they have the control • One other market the client is interested in is the credit challenged market • Some promotions we have currently been using are giving out head sets to lock in people and marketing “cool” ring tones • We sell through box stores like future shop etc. • Real money in cell-phone sales comes from the re-occurring purchases of prepaid cards NOT the cell phones themselves <u>Competitive Situation</u> • Mix between post-pay (monthly bills) and prepaid • All competitors offer phones to youth but have not done a good job as the market is still relatively untapped. • The market for cell phone consumers is slightly growing • Family post pay plans are increasing in popularity as the average number of cell phones/household is increasing • Competition primarily uses TV/Billboard advertising <u>Distribution</u> • Website, retail outlets and convenience stores • Have the ability and resources to open own retail stores Assume your budget is \$10MM what marketing strategy do you recommend Marketing Strategy I used: Phase 1 – switch advertisements to focus on target (youth) controlling mothers, focus on convenience and flexibility of prepaid plans for youths Phase 2 – build brand amongst youth, so they are accepting of client's cell phones and packages Phase 3 – Partner with Money Mart and other such “quick cash” companies to go over the credit challenged segment. Perhaps use advertisements in subways and bus stations as they will likely be frequented by this target group Phase 4 – expand to the higher revenue generating post pay plans
Other Helpful Hints	I immediately recognized this case as the Virgin Mobile entering Canada. This really helped to frame my line of questioning. The trick in this case is to realize early there is no right answer. This is your opportunity to be creative and know when you have enough information to make a decision.

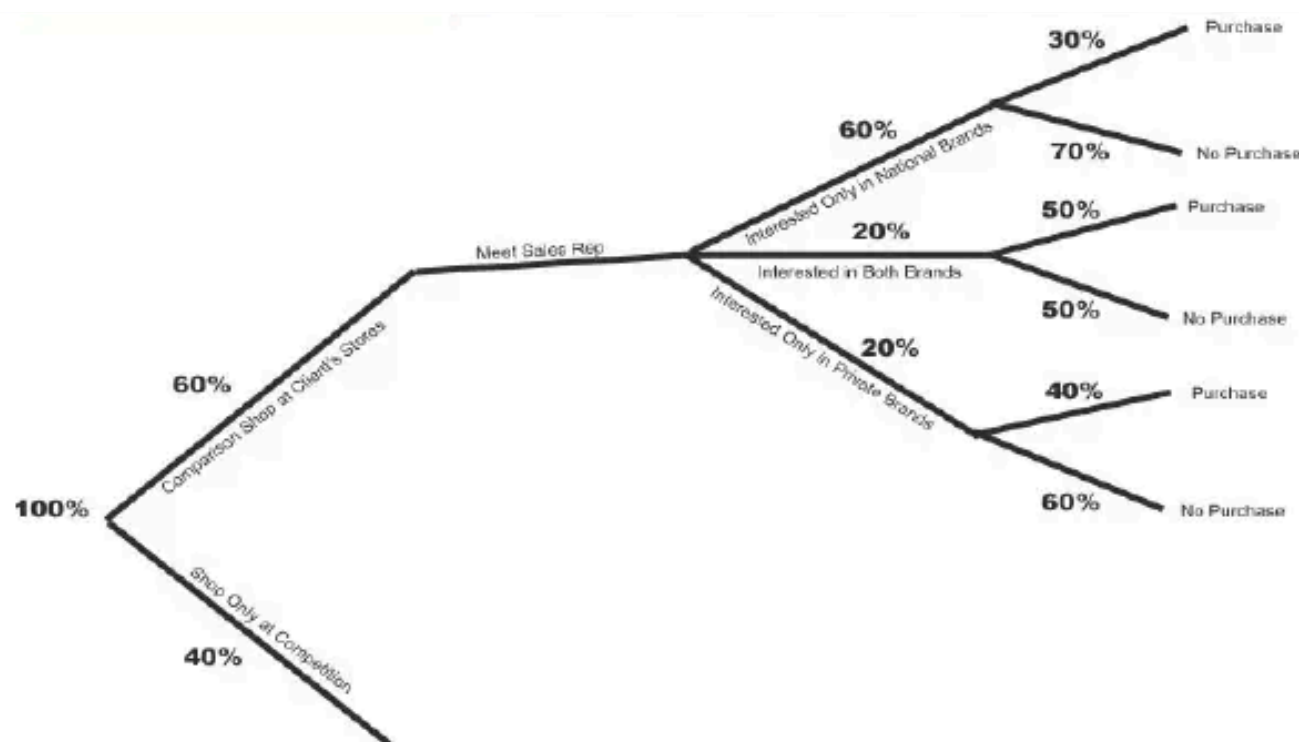
Source/The Firm	BAIN
Date/Context	First Round Interview for a Summer Analyst Position
Issues Covered	Brainteaser ☐ Estimation X Business Case X
Issue/Problem Posed	In 1999, there was a deregulation in the Ontario payphone market, in an attempt to remove one of the last remaining Bell monopolies. With the increased competition, Bell decided to upgrade most of its phones with smartcard technology in 2001. By 2007 Bell is hoping to convert a majority of its phones to only accept these smartcards. Why is Bell Canada doing this??
Information Provided	Current payphones accept smartcards, coins and allow for long distance calls. For 1-800 numbers Bell collects a small fee from the corresponding company. Smartcards are prepaid phoning cards with designated \$\$ amounts on them. More money can be added to them, similar to a debit card.
Solution	The important thing to realize is that you are taking on the role of business academic here...understanding why a company decided to make this complex business decision. <i>Note: I structured this case using something like the 3Cs framework, but in retrospect I think using standard frameworks is wrong for this case given you are not trying to solve a business problem.</i> I suggest using this type of approach which is more creative and more academic: The interviewee should first identify what were the critical questions that Bell asked to come to their business decision. Doing this in chronological order is a bonus. 1) Deregulation impacts the competitive landscape, so what has happened to Bell's market share in the last two years (1999-2001)? A: Bell still maintains a huge market share in payphones at 85% Drill Down Question: a) Who holds the other 15% and do they use Smartcard technology? A: the remaining 15% is shared amongst 4 other competitors, roughly evenly. They all use smartcard technology exclusively for their phones. 2) What impact has the increased competition had on customers buying decisions? Has customer behaviour changed? <i>With this type of question the interviewer will probably shoot back asking, well what do you think might have changed?</i> A: Smartcard exclusive phones have really changed customer buying decisions in some areas. Payphones are a very region specific business so smartcard purchases will reflect what company is most dominant in a particular location frequented by the user. Customers who travel more frequently throughout the city will purchase smartcards from Bell usually because of a convenience factor. Drill Down Question: a) So smartcards are not universal? They can't be used between competitor phones?? A: Yes that is correct. 3) 2001 also so the emergence of the cell-phone market. What type of impact has this had on payphone usage? A: I can't really give you a quantifiable number, except to say that cell phones have drastically impacted payphone and smartcard sales. Cell-phones have essentially become a replacement product for payphones. Drill Down Question: b) Payphones are still around for a reason, so what market segment(s) still use them?? A: Payphones are still used by the technologically illiterate Ontarians (seniors

	mostly) and pre-teens who still frequent malls etc. but don't own a cell phone. c) Are there any other industry factors I should be aware of? A: Nope. Cell phones are the big one. Here is a good point in the case to summarize your findings. Obviously these changes have had a negative impact on Bell's payphone revenues. The question still remains though, why switch to smart cards?? Here is where understanding the profit dynamics of the payphone business is important. 4) Are profits decreasing proportionally to revenue decreases? A: No they are declining much faster Drill Down Questions: d) So this would indicate that costs of payphones are primarily fixed? A: Yes that is correct. 5) What are the fixed costs associated with payphones? <i>Interviewer will likely ask what do you think?</i> Costs: Smart Card Phone: \$100/per phone per year Coin Operated Phone: \$500/per phone per year (sorting costs etc.) Pick-Up coins: \$200 additional/phone per year (actually paying someone) Maintenance: \$500/ per phone per year Base Cost of Unit (Coin and Smart Card): \$500 (Investment) Base Cost of Unit (Smart Card Only): \$400 (Investment) You may try to avoid further math by making the obvious point the smart card only phones save Bell \$200/ for the first year per phone and \$600/ each year after. However the interviewer will likely try to complicate the case further by asking for a total profit for Bell annually under each method. First estimate # of calls made per phone per year. Multiply this by \$0.25 per call. Use this to figure out revenue per phone. Then use the costs above under each type of phone assuming just coin phones and compare to just smart card phones. This should give you a rough profit per phone per year. Then do a market sizing of all payphones in Ontario. Take Bell's share (85%). Multiply this by profit per phone/year and Thank God because you are done!! Unless you really screwed up the calculations it should become blatantly obvious that Smartcards are the way to go to remain profitable with payphones whose use has decreased substantially. Make sure to also summarize everything and say why Bell is heading towards this ideal direction for profitability in the payphone market. <i>Note:</i> if you want to prove yourself you could make the observation that the amount of revenue per smart card is phones is higher because people tend to buy the cards and not fully use them, or lose them etc. This will really complicate your numbers though.
Other Helpful Hints	This can be a tough case to get through in 30 minutes. Although the qualitative stuff is important, the quantitative element should be the real focus. If you really like marketing you could try to pursue next steps for Bell area, trying to leverage their home phone subscribers in marketing campaigns with smart cards etc.

Source/The Firm	BOSTON CONSULTING GROUP
Date/Context	First Round Interview for Summer Analyst Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	Over the last two years, market share has dropped considerably for an appliance store in the US. The client would like you to find out why, and suggest a way to regain the market share that was lost.
Information Provided	The appliance store sells both national and private brands. Market Share is measured in \$s. If they ask for more specific information on what a private brand is: - A brand created, marketed and distributed only by a specific company - think president's choice just with appliances instead of groceries - a way for company's to create customer loyalty - most competition in appliances has their own private brands
Solution	<u>Company</u> • 2/3 of sales are from national brands • Prices have remained unchanged and are slightly higher than industry averages • Sales have been a bit flat recently • The store has a good reputation for service etc. • Only sells appliances • The store is all across the US • Sales Reps do not work on commission and have been around for a long time <u>Competition</u> • Other major department stores • Mom and pop stores • Emerging competitors are Home Depot and Lows who are quite aggressive and have lower prices <u>Customer</u> • Sell only to general population not business • Loyalty to national brands is decreasing • Private brands have become increasingly popular • Prefer "cross shopping" – the ability to shop for more than one thing at a time So at this point in the case it should become more obvious that although some external market conditions might have slightly influenced market share, a closer look must be done internally. Should the interviewee ask any of the following questions, present them with exhibit 1. If not hint them towards this line of questioning. 1) How many people that actually comparison shop at our stores actually make a purchase? 2) Does the sales force equally suggest both private and national brands <u>Questions asked by interviewer when shown the exhibit:</u> 1) What percentage of client's customers (in decimal format) are interested in national or private brands but not both? A: $(1-(0.6*0.2)) = 0.88$ • Does this number indicate anything? There is a clear division between customer interests in brands. • Why? Sales force are pushing national brands over private because these are the brands they know the most about. Sales people have been around for a long time and believe private brands sell themselves. Remember, private brands are becoming more popular, so it's not related to customer preferences. • Based on this chart which brand is leading with purchases? Assume purchases made from a person interested in both brands are split equally between National and Private.

	National: $(60\% \times 60\% \times 30\%) + (60\% \times 10\% \times 50\%) = .138$ Private: $(60\% \times 20\% \times 40\%) + (60\% \times 10\% \times 50\%) = .078$ - Can any aspect of these numbers indicate why market share is down? Perhaps competitors are selling more private brands/national brands which may generate slightly higher revenue. - So what numbers in this chart do we have to focus on changing? Private label seems to have a higher conversion rate then national. If we can get the 60% only interested in national to private or at least interested in both we should increase sales dramatically. - Alright wrap this case up for me and give me some type of recommendation and next steps
Other Helpful Hints	Yes this case is challenging and the interviewer doesn't expect to gather all the information necessary in only 30 minutes. But understanding how to calculate using decimals and what the numbers actually represent is key to doing well. Make sure you take 30 seconds to look over the chart before you even begin talking.

Exhibit 1

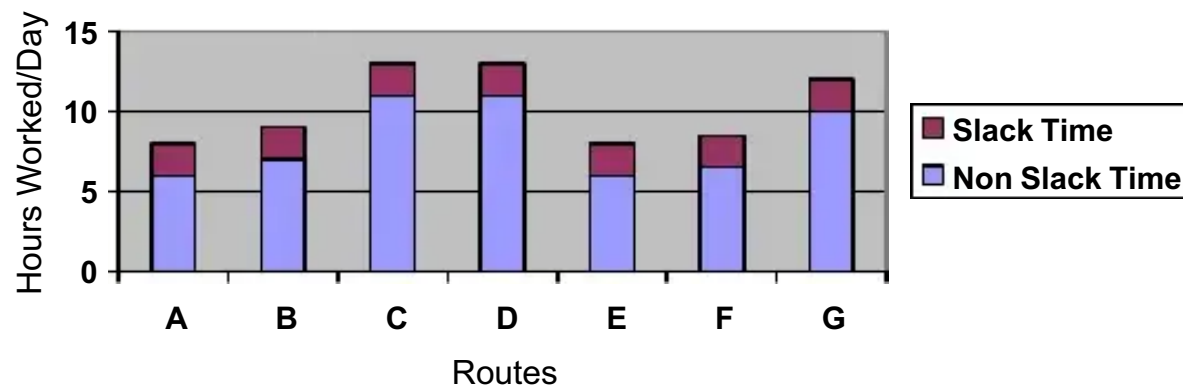


Source/The Firm	AT KEARNEY
Date/Context	First Round Interview for Full Time Analyst Position
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	The President of a branded food manufacturer of baked snack foods has asked for your help. The company has a network of 100 warehouses across Canada and the US. These distribution centres are used to coordinate the delivery to most delivery stores across North America. The president requires a benchmarking study to ensure distribution costs are in-line with the industry. What would you study?
Information Provided	No trucks cross the Canada/US border.
Solution	<u>Macro – How the Distribution Network is Divided</u> - Trucks are geographically divided by customers - Deliveries that they do first are at the back of the truck - All stores are on a set schedule which is consistent week by week - The grid is completely optimized i.e. the truck order in which deliveries are made is the shortest schedule possible <u>Micro – Loading of Trucks etc.</u> - All trucks are loaded to full before leaving the distribution house - The speed in which trucks are loaded at the warehouse is not an issue - Labor costs for truck drivers only is much more expensive than the competition Interviewer: So you discover that labor costs are what's driving up distribution costs for your client. What information would you need to find out why? Questions I asked: - Is the labor wage the same – “yes assume it's the same” - Is the units delivered/# of truck drivers roughly consistent with the rest of the industry – “yes every worker has a maximized and equivalent workload” - What about worker utilization, time spent on the delivery versus time spent not on the delivery – “I am glad you asked that, take a look at this and tell me what you think” (See Exhibit 1) Exhibit notes: - Slack time is defined as anything that isn't driving unloading or loading - All routes are built roughly equal for driving time required - The only difference in routes is that some have larger stores (by revenue) in them than others (only give this information if asked) Notes on Exhibit 1 – the interviewee should recognize - Slack time is not the issue – every driver is taking equal breaks etc. - The problem must be with the regular working duties of the drivers. Particularly C, D and G are spending a lot more time on their routes daily. Why? - It was identified earlier that loading at the warehouse is not an issue so that cannot account for the time difference/route - So the problem has to be with unloading (since it's the only variable left) (interviewee should be able to recognize this) Interviewer: So unloading is likely where extra hours are being spent for some of the drivers. What possible problems could occur when unloading to cause the discrepancy? - There are more crates to unload for routes C, D and G – No, the shipments are about equal in size and physical time required to unload. - Since some of the routes have larger stores (by revenue) than others, maybe the drivers have to wait in line for other delivery trucks to finish unloading – BINGO – as it turns out routes c, d and g have some large retail stores like Wal-Mart that have hundreds of vendors trying to unload during peak times Alright so you finally discovered the problem, what do you recommend to solve it? - Change the driving schedule for C, D and G to deliver to large retailers during non-peak times – as long as overall it takes less hours then the company will save money - Try to ask the retailer to try to free up a loading dock at the anticipated

	delivery time – since client's deliveries are quite consistent
Other Helpful Hints	Cases like this are becoming more and more common. The purpose is to see if the interviewee really understands what numbers they need and what type of information they need to solve a problem. In the case, the answer as to why labor costs are so high is not blatantly obvious, to solve it you really need to be creative.

Exhibit 1

Slack Time by Driver



IVEY MANAGEMENT CONSULTING CLUB

Case: M&A/Finance/Strategy – Royal Bank of Scotland

Discussion Points: Industry Attractiveness, Competition, Regulatory Issues

Style Considerations: Verbal, Written, Mental Organization and Structure, Performance Under Pressure, Outside-of-the-Box Thinking, Dealing with New Terminology and Industry

Source/The Firm	UNKNOWN
Date/Context	
Issues Covered	Brainteaser ☐ Estimation ☐ Business Case X
Issue/Problem Posed	Our client is the Royal Bank of Scotland (RBS) group; currently the UK's second largest banking institution. Royal Bank has grown from a regional Scottish bank into the world's eight largest lender with over \$6.3 billion in assets and a presence in 14 countries in 2005. For further growth outside traditional markets, RBS is considering purchasing an equity stake in China's second largest bank, the Bank of China, which is state-owned. What are the important considerations before making this decision?
Information Provided	None
Solution	- Consider a Porter's Five Forces framework to analyze: ➤ Industry attractiveness and trends in China and the Bank of China ➤ Competitiveness in the banking M&A market ➤ Regulatory, Political, Cultural issues that must be addressed in the deal - Discuss the economics of the purchasing decision Information below can be provided as soon as these (or similar) questions are asked: Q. Before we begin, I would like to understand RBS's M&A history. By understanding how much have they grown organically or through acquisition in the past, I can better understand RBS's goals and objectives for this purchase. So, why is RBS considering this purchase? What are its goals? A. Royal Bank has a long history of growth through acquisition, having spent \$61 billion on acquisitions in the past five years. Increasing competitiveness in Europe and North America are squeezing margins in traditional markets, resulting in a slowdown in revenues from lending interest and also an increase in bad debts. Q. I would assume that considering this time frame, China is becoming an increasing attractive market for foreign investment. Can you quantify how attractive the Chinese economy actually is? A. You are right. China's economy grew at a rate of 9.4 percent in the first three quarters of 2005 as domestic and foreign investments surged. RBS is hoping to get a piece of the Chinese market ahead of late 2006, when China fully opens its markets to overseas competition. Q. Since the economy is doing so well, I would further deduce that the Chinese banking business domestically is also growing as citizens have more purchasing power in their local economies. How attractive is the Bank of China specifically as an investment? A. The deal, which is subject to regulatory approval, will give RBS access to a bank with 11,307 branches, a 12 percent share of the loan market in mainland China and 14 percent of the savings market. RBS has had "modest activity in corporate banking and wealth management", but by gaining access to the Bank Of China's distribution channels, and there is great potential for collaboration to provide other services such as residential banking and lending, which "would have been inconceivable without the partnership". Q. That makes sense. It seems like there are clear synergies and opportunities to expand RBS's current offering, and maybe use its learning from China and apply them

	to their more traditional markets. What are RBS's intentions with the purchase? A. What do you mean? Assumption: RBS could aim for two types of control in the Bank of China; namely, minority or controlling interest. Since we are discussing China, I would suspect some sort of governmental, political, or regulatory barriers might limit the scope of our investment. Is this a fair assumption? A. RBS will make a \$3.1 billion investment in Bank of China that will give the bank control a 10 percent stake. It will co-invest on the deal with Merrill Lynch & Co. to share the risk. RBS has not publicly announced intentions to increase the size of its investment over time. Chinese law currently limits foreign bank investment to a total of not more than 20 percent equity share in its state-owned banks. Assumption: The 10 percent stake limits potential political challenges in the regulatory approval process by seeming like a modest stake, shared between two foreign banks. So far, this seems like a very attractive offering that RBS should not pass up on. I'm curious whether other foreign banking institutions are also interested in the Chinese market? If they are, we should evaluate strategically whether this is the best fit for RBS and how our stake would increase our competitiveness with other banks. A. Last year, Britain's HSBC acquired a 19.9 percent stake — the maximum allowed for a single foreign investor — in Shanghai-based Bank of Communications, with an agreement that its stake could double after 2008 if regulations change. Deutsche Bank and Singapore's DBS Group plan to buy shares in China's state-owned Guangdong Development Bank and did not deny reports to wanting a 51 percent controlling stake by 2010. Overall Assumptions: • RBS has a history of growing through acquisition and is thus well prepared to undertake this deal • China and the Chinese banking market represent significant synergies and growth prospects for the UK bank • RBS must obtain stake in the Chinese banking market to remain competitive with other foreign banks as China opens its markets to foreign investment Interviewer: Sounds reasonable. Any other considerations? • What would the competitive response of other foreign and domestic banks be to this deal? • Are these cultural or managerial differences between European and Asian banking that must be taken into account? • What are the implications of having share in a state-owned bank under a non-democratic governmental regime? • What would the state say to Chinese citizens that are skeptical about the implications of foreign investment? <u>Follow Up Question</u> Q. It is likely that some citizens and domestic analysts will be hesitant about the deal. How would you pitch the deal to critics?
Other Helpful Hints	Yes qualitative cases can be hard.

IVEY MANAGEMENT CONSULTING CLUB

Source/The Firm	TELUS MOBILITY
Date/Context	TELUS Mobility Full time (Strategic Planning & Execution)
Issues Covered	Brainteaser ☐ Estimation X Business Case ☐
Issue/Problem Posed	You work for a company that sells wall advertisements (2 feet wide by 4 feet tall) in health clinics. What is the market size in London for wall advertisements?
Information Provided	- Wall ads are placed in waiting rooms for health clinics - Pharmaceutical companies are the main clients
Solution	- Assume that there is one clinic for every 20,000 people in the city – since there are 300,000 people in London, there will be 15 clinics in London. - Assume each clinic has 2 waiting rooms - Assume there are 3 10-foot walls on which to advertise in each waiting room. Therefore, each wall can hold 5 ads. 5 ads per wall * 3 walls per room * 2 rooms per hospital * 15 clinics = 450 ads. Assume each ad sells for \$1000. Therefore, the market size is \$450,000. - Note how the assumptions flow from high level (city) to low level (waiting rooms)
Other Helpful Hints	- Tell the interviewee that there is unlimited demand for wall ads in London (ie: they will be able to fill every waiting room). - This question is very open-ended. The actual numbers that the interviewee uses are not important – simply ensure their logic, assumptions and train of thought flow well.

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	THE TADDINGSTONE CONSULTING GROUP
Date/Context	1st round phone interview for summer internship 2004
Issues Covered	Brainteaser ☐ Estimation x Business Case ☐
Issue/Problem Posed	Please estimate the dollar amount of mortgage interest payments made in Canada last year.
Information Provided	None
Solution	A relatively simple case; all you need to know is some basic stats and how a mortgage works. The first step was to approximate how many households there are in Canada. Then, you need to approximate what percentage of this group have their property mortgaged. Next, you need to determine the value of an average property across the country, and what percentage of that average property value is actually mortgaged. After this, figure out an average interest rate (taking into account mortgage terms and the corresponding rates), and finally multiply this interest rate by what you determined the total mortgage amount.
Other Helpful Hints	I came up with a pretty ridiculous answer, something like 100 billion dollars. I was asked if I thought this answer made sense, and I was honest and said I didn't think it did. The interviewer also asked where I would go to verify the number I had (or, in my case, figure out the "correct" answer").

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	THE TADDINGSTONE CONSULTING GROUP
Date/Context	2nd round written answers for summer internship 2004
Issues Covered	Brainteaser ☐ Estimation x Business Case ☐
Issue/Problem Posed	Please estimate the number of Canadians logged on to an online banking website at this moment.
Information Provided	None
Solution	This was one of my favorites. I started off by assuming all online banking would take place during the day. I calculated the "Canadian day" to be 15 hours (12 hours plus 3 major time zones). Next, I figured out the number of people that used banking and online banking, respectively. I think I assumed 30% or 40% used banking (to get rid of minors and to not double-count households in which only one spouse would do the banking), and then of that I assumed 40% of bankers used online banking (about 4 million people). I then made the preliminary assumption that online banking users would be equally distributed throughout the 15-hour day, giving about 27 thousand users per hour. I then chose my "at this moment" which was 5 in the afternoon, and assumed that there would be more people on banking websites at that time than on average. I thought 40% more would be a justifiable figure (due to people being at home from work etc.), so my final answer came to about 38 thousand people.
Other Helpful Hints	I had the luxury of thinking things through on this one since Taddingstone gave me a week or so to fill out a whole list of questions. That being said, they also must have expected a "better" answer than if they had given this one on the fly.

Case: Revenue/Cost Analysis – American Multi-Cinema (AMC) Theatres of Canada

Discussion Points: Revenue/Cost Drivers, Breakeven, Profitability

Style Considerations: Quantitative Analysis

Source/The Firm	UNKNOWN
Date/Context	
Issues Covered	Brainteaser ☐ Estimation x Business Case ☐
Issue/Problem Posed	American Multi-Cinema (AMC) Theatres is the world's largest movie theatre chain. They currently operate 5 locations in Canada. Facing strong pricing competition from the recently merged Famous Players and Cineplex Odeon brands, AMC is considering reducing its average ticket prices by \$3 to match the competitors. What are the "economics" of such a decision and should they reduce their prices?
Information Provided	- Average admission price is currently \$12/person. - Average concession revenue is \$5/person. - AMC Theatres Canada attracts 5,000,000 visitors a year to all its theatres in Canada.
Solution	- Determine how AMC Theatres makes money. - Evaluate the pros and cons of reducing ticket prices. - Make a recommendation. Revenue Drivers – Assumptions: \$12 admission multiplied by the number of visitors. \$5 concession income multiplied by the number of visitors. Assume no additional revenue (from vending machines, conferences and parties, special events, etc.) Key Issues: If the ticket price is reduced, AMC loses $\\$3 \times 5\text{MM} = \\$15\text{MM}$ ($\\$3 \times \#$ of visitors). To overcome this loss, they have to increase their revenues somehow from either increased visitors or increased concession sales. Is it likely that visitors will spend more per visit if the ticket price is reduced? Yes, visitors will likely spend \$1 more on average if the ticket prices are reduced by \$3. Therefore, the two ways to increase revenues are to either increase the number of visitors and/or increase the concession sales. Assumptions: Number of current visitors = 5MM (or whatever number interviewee sizes): Annual loss of \$15MM if the ticket price is reduced. Key Question: Can we attract enough new visitors to offset a \$15MM loss? Assuming no loss of visitors, the increase in revenue from concession will be $\\$1 \times 5\text{MM} = \\$5\text{MM}$. Also, each new visitor contributes \$9 for ticket revenue and \$1 for concession revenue = \$10/new visitor. $\\$10\text{MM}/\\$10 = 1.0\text{M}$ new visitors are needed. (gut check) $1.0\text{MM} + 5\text{MM}/5\text{MM} = 20\%$ increase in visitor attendance. Qualitative Pros and Cons: Promotes switching for customers of other theatres - Allows for "testing" of AMC – can use loyalty programs to retain customers - May be perceived as a reduction in quality of offering/service - Needs to be supplemented by marketing/promotion to make customers aware of price change - Assumes no new growth in size of moviegoer market Recommendation: Based on these assumptions, an increase of visitors by 20% in one year considering

	the competitive environment and no growth in attendance, is probably not likely. Do not lower ticket prices. May want to consider changing prices differently for different ticket categories. Also consider other incentives to attract customers: loyalty programs, promotions, student discounts, etc.
Other Helpful Hints	

IVEY MANAGEMENT CONSULTING CLUB

Richard Ivey School of Business
The University of Western Ontario



Source/The Firm	BAIN
Date/Context	Final Interview for Summer Associate Position
Issues Covered	Brainteaser X Estimation ☐ Business Case ☐
Issue/Problem Posed	How many degrees are there between the minute and hour hands on a clock when the time is 3:15?
Information Provided	None
Solution	12 hours on the clock make 360-degrees. Thus, one hour is 30 degrees. The hour hand moves $\frac{1}{4}$ of the way between 3 and 4, so it moves $\frac{1}{4}$ of a twelfth ($\frac{1}{48}$) of 360 degrees. The answer is 7.5 degrees.
Other Helpful Hints	Use a piece of paper and work this one through

Ivey Management Consulting Club

Back-of-Envelope Math Test

Version 1.0

Introduction

The purpose of this test is to prepare you for the type of math questions encountered in consulting case interviews. Most questions are based on actual interviews. While the questions are basic math, you shouldn't let this fool you. Your ability to make quick, accurate calculations under stress without the aid of a calculator will make or break your job prospects. If you are like most MBA students, it has been some time since you had to work with paper and pencil.

There aren't any trick questions – just do the math.

Practice these and similar questions until you can perform flawlessly under stress.

Email changes or suggestions to dmacdonald.mba2003@ivey.ca.

Instructions

1. The only tools permitted are pen/pencil and paper. No calculators of any kind are to be used.
2. Use a blank sheet of paper for your calculations, just like you would in an interview.
3. Try to emulate the stress of an interview. Take the test in front of a television or in a room full of people.
4. For even greater realism, have someone read the questions to you.
5. There are 25 questions in total.
6. Answers are provided on the last page.

Suggested time limit: 40 minutes.

The Test

A. Market-Sizing Questions

1. There are 7.5 million people in Chicago. If the average household has 1.5 people and 10% of households own a piano, how many pianos are there in Chicago residences?
2. If a piano gets tuned on average once every five years, a piano tuner can tune one piano every four hours (including travel time) and a piano tuner works 40 hour weeks with two weeks of vacation per year, how many piano tuners does Chicago need?
3. If 20% of Chicago's population is in school and an average school has 500 students, how many schools are there in Chicago?
4. If each school has an average of five pianos and each of these pianos gets tuned every other year, how many additional piano tuners are required to service these instruments?
5. If a million people work in downtown Toronto every day, the average office building is 30 stories tall and 200 people work on a typical floor, how many office buildings would you expect to find in the city?
6. A football stadium has just been built in downtown Ottawa. If the stadium's capacity is 40,000 and there are 30 events scheduled per year, how many people will pass through the gates if the stadium averages 80% capacity?
7. If 10 of the events are football games and the rest are concerts, what will the concession revenues total if half the attendees make a purchase with an average of \$10 at football games and \$7.50 at concerts?
8. If a quarter of the seats are premium, half are regular and a quarter are discount, what are the ticket revenues for an entire sell-out season of football if the sections are priced at \$50, \$25 and \$10 respectively?
9. If the average bank branch in Canada has, on average, two teller windows open at all times and it takes six minutes to service the average customer, how many customers will the branch serve annually assuming full utilization while open six hours per day and 250 days per year?
10. Using the assumptions from the previous question, if there are 30 million people in Canada and $\frac{2}{3}$ of them are active banking customers who go into a branch on average once every other month, how many personal banking branches would you expect there to be in Canada?
11. There are approximately 250 streets running east-west and 10 avenues running north-south in Manhattan. Assume that 60% of the land is zoned for commercial use and 40% for residential and other purposes. If there are an average of 2 pay telephones at every commercial intersection (and none anywhere else), how many street-level payphones would you expect to find in Manhattan?
12. If there are 30 million people in Canada, the average person lives to be 66.67 and the country's growth rate through reproduction is flat (i.e. births=deaths), how many babies do you expect will be born in Canada today? (use a 360-day year)

B. Break-Even Questions

13. Your company has just spent \$5 million developing a new, improved widget. If it costs \$25 to make each widget, how many widgets will you need to sell at \$50 in order to recover the development costs?

14. You find a way to reduce costs by 60%. What is the new break-even point?

15. You are the marketing manager for a new kind of washing machine. If variable costs are \$200 per machine and fixed costs are \$1.5 million/year, what will you need to price the washer at in order to break even on sales of 5,000 units per year?

16. Your research indicates that customers will pay a maximum of \$400 per washer. How many additional units will you need to sell in order to recover your fixed costs?

C. Profit-Loss Questions

17. A manufacturing company with \$40million in sales has the following cost structure:

Item % of Sales

Raw Materials 20

Manufacturing 40

Shipping 10

Marketing 20

SG&A 20

How much money is the company making each year?

18. The production manager has just told you that she can cut manufacturing costs by 20%. How much, in dollars, will you need to cut from SG&A in order to make a 2% profit on sales?

19. A car company is considering paying \$140,000 for a one-minute advertisement during the Grey Cup. Their research has indicated that the spot will result in a 0.002% conversion rate of male viewers aged 18-35 and a 0.000% conversion rate for all other segments. If 8 million people will see the ad and 50% of viewers are in the target group, what is the estimated advertising cost for each car purchased as a result of the ad?

D. Operations Questions

20. A lawnmower manufacturer uses an assembly line to manufacture its product. If the line produces a new lawnmower every 4 minutes and it takes 7 hours for the raw materials to proceed through the line, how many lawnmowers worth of work-in progress inventory does the company have?

21. An auto maker practicing just-in-time delivery has room in its warehouse for 1440 widgets. The company uses 12 widgets/hour during an 8-hour shift and runs at 3 shifts per day. If the auto maker always orders a full warehouse worth of widgets at a time, how far apart, in days, will they need to re-order?

22. The company needs to time its orders so that the warehouse empties at exactly the same time as the new shipment of widgets arrives. If it takes 36 hours for the supplier to deliver a widget shipment once an order is received, what number of widgets in inventory should the company use as a reorder trigger?

E. Miscellaneous Questions

23. Lake Ontario is 300km long and averages 50km wide and 50m deep. How many cubic metres of water are in the lake? (Bonus question: how many litres?)
24. The Empire State Building's observation deck is on the 86th floor. If each floor is 6m tall and a single stair is 25cm high, how many steps are there between the ground and the observation deck?
25. What was the total number of gifts received in the song *The 12 days of Christmas*? (i.e. by the third day a total of 10 gifts had been received: 1 partridge + 2 doves + 1 partridge + 3 hens + 2 doves + 1 partridge)

Answer Key

1. 500,000 pianos
2. 200 piano tuners
3. 3,000 schools
4. 15 additional piano tuners
5. 167 office buildings
6. 960,000 spectators
7. \$4,000,000
8. \$11,000,000
9. 30,000 customers
10. 4,000 branches
11. 3,000 pay phones
12. 1,250 babies
13. 200,000 widgets
14. 125,000 widgets
15. \$500
16. 2,500 additional units
17. Loss of \$4,000,000 per year
18. \$1,600,000
19. \$1,750 per car
20. 105 lawnmowers
21. 5 days
22. 432 widgets
23. 750 billion cubic metres (or 750,000 billion litres: $1\text{L}=1,000\text{cm}^3$)
24. 2,040 steps (don't count the 86th floor)
25. 364 gifts