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The Editor's Corner

In our first number of the first volume the editorial board dedicatedly promised to keep moving toward our aim: to have a journal that would provide readers with findings and research in a variety of areas. We keep the promise – the second number is published. However, it was not only our promise that kept us moving and working on the second number.

We were also encouraged by your responses to the first number. We have received positive and supportive letters and e-mails from readers in Europe and North America, which increased the enthusiasm to continue with our work. The letter by Alan Anov is published in this number in the new section called Reflections, Comments, Discussions. We kindly invite you to open discussions on the articles, send your comments and engage the audience in critical dialogues.

The second number of the Journal embraces two research areas, economics and education. Kevin Lawler and Chih-Cheng Yang discuss the competition and oligopoly of UK grocery retailing. Their article might raise some interesting issues also for a reader who is not 'an economist'. Jani Beko discusses demand functions for services of public railway passenger transportation and Matjaž Novak provides an analysis of the nature of economic growth of the Slovenian economy. Slovenia has undergone major economic changes and restructuring in the recent, post-independence era, therefore both articles contribute to better understanding and knowledge about current movements in the Slovenian economy. Njoki Wane and Wambui Gathenya analyse policy reforms in Kenya and their implications for equitable access to education. They discuss 'gender' and 'class' barriers that might affect education for women in Kenya. With their article, the authors have 'opened a page' in our Journal that might be of an interest for other scholars and researchers – the question of equity which is still under-discussed in the current 'competition and survival' global village. Keith Walker, Kirk Anderson, Larry Sackney and Jeff Woolf discuss the first year school principals and factors that affect their success. Their article, if seen in the context of decentralization and devolution of power to schools, offers an insight into the first year principals who are confronted with challenges but also with tasks and duties that might threaten their success. The article might specifically be found interesting for those readers who work with principals.

In November 2003, Faculty of Management Koper also hosts an in-

ternational conference Knowledge Society: Challenges to Management. We hope to have the opportunity to publish some articles on this topic in the Volume 2 Number 1. We kindly invite you, the reader, to consider the topic and contribute your work to the Journal. Also other topics are welcome.

Dear reader, author, Editorial Board member! At the end of 2003, let me use this opportunity to express my gratefulness and appreciation for your contribution to the Journal. Your work, either by contributing articles, reviewing them or working as a Board member, has shaped and framed the Journal. As the editor of the Journal I am pleased to have you 'on board' and wish you all the best in forthcoming 2004.

Anita Trnavčevič
Editor

Competition and Oligopoly: A Case of UK *Grocery Retailing*

Kevin A. Lawler
Chih-Cheng Yang

In this paper we develop a model of Bertrand price competition with uncertainty as to the number of bidders. The auction models predict retail price dispersion as an observable feature of price discrimination. The implications of the auction models are tested using a logit model on primary data. Some simulations of the logit model further enrich and capture critical states of chain-store rivalry. The findings show that consumer characteristics define type of store choice and that an auction model of price competition with uncertainty is an appropriate way to model retail grocery competition.

Introduction

In this paper, we use the term 'discount stores' to apply to those which offer a wide selection of primary shopping venues and which are characterised by low prices and low service attributes. With particular reference to the North East, the dominant discount formats are represented by Aldi, Lidl, Netto, Kwik Save and Somerfield. The quality supermarket retailers that feature higher quality service levels and higher prices are Asda, Morrisons, Sainsbury's Safeway and Tesco. Competition between these two strategic groups creates price dispersion in urban grocery markets. The aim of the paper is to explain this phenomenon in terms of market segmentation and auction theory. Hypotheses concerning price dispersion derived from the auction model are tested using logit analysis.

In theory, discount stores may enhance price competition in grocery sub-markets because:

1. they represent a significant innovation appealing to price sensitive buyers,
2. they are a means of low cost entry in supermarket sub-markets in metropolitan areas,

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3. discount stores constitute new strategic groups in Porter's (1976) sense, potentially reducing the ability of incumbents to coordinate competition,
4. they stress low prices so their entry is likely to stimulate price rivalry with at least some incumbents.

Apart from the perception of relatively low price levels, there are no universal features that can be applied to describe all discounters, however within the discounter category there are further sub-divisions which are – limited line discounters, discount supermarkets, hypermarket discounters (Kaas 1994).

To date, UK supermarket sub-markets have been dominated by the multiples, Sainsbury's, Tesco, Safeway, Asda and Gateway (Davies 1992). The competition between the dominant players in these markets in the UK has instigated iterative changes in the strategic characteristics of the major supermarket chains. As a consequence, the UK multiples have converged towards adopting a homogeneous format, where all have similar attributes in, for example: national coverage, quality product ranges, quality images, high service levels and superstore/hypermarket locations.

Marion (1998) suggested that each of the food store formats illustrated in Figure 1 constitute new strategic groups. Different formats offer a unique mix of price, non-price and service characteristics. Formats on or above the horizontal axis compete with each other for major shopping trips of consumers: the remaining groups largely compete for secondary shopping activity.

Roberts et al. (1996) argued that price dispersion may result from such factors as costs or other unobserved brand heterogeneity. In this study, we seek to contribute to an understanding of strategic market segmentation between discounters and quality chain-store food retailers. A feature of many studies of supermarket grocery retailing is that the focus of the econometric work is at an aggregative level where time series data exist. The focus of this study is, by contrast, on the demand and supply sides of grocery sub-markets. The contribution of the paper is to estimate the conditional probability that buyers with certain characteristics make repeated trips to similar classes of store. Throughout the rest of the paper the generic discounter groups are referred to as type D store, whereas the quality multiples are dubbed type P stores.

The paper seeks to make a specific contribution in two areas: first developing a Bertrand model with uncertainty as to the number of direct

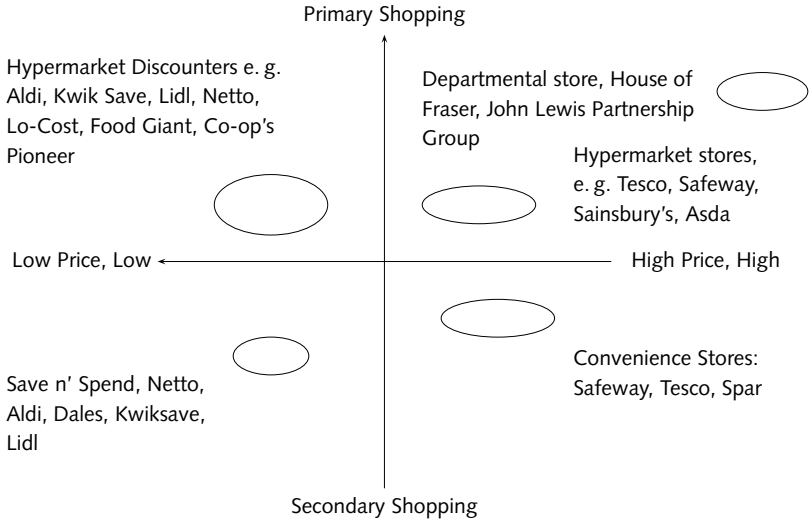

Figure 1: Strategic Groups in Grocery Supermarket Sub-markets in the North East

rivals using an auction format. Second, the paper tests implications of this model regarding consumer choice using logit analysis.

Applying Auction Theory to Retail Grocery Price Competition

The similarities between Bertrand price competition and first price sealed bid auctions is well known (Baye 1997). The model developed here can be viewed as tackling the question as to what is the optimal bid if the number players in a sealed bid auction is not known. However, uncertainties can arise on the demand side too, when consumers know some retail prices today but they do not know all prices today or tomorrow. Moreover, time constrained buyers may regard rival goods as new perfect substitutes, or search costs may be unclear from the grocer's viewpoint or, consumers may simply vary in sophistication regarding search behaviour.

A Simultaneous Symmetric Bertrand Model

Let the variable x represent the probability that a given grocer does not continually compete, so periodically does not bid for particular classes or brands of groceries. This could be because the current supply chain has reached capacity, priced grossly in excess of reservation prices by mistake or, because some consumers have not realised that a particular seller may bid or is bidding. Accordingly we model a first price sealed bid auction

for grocery retailing. This captures the essence of Bertrand price competition in grocery sub-markets, where a number of grocers offer repeated bids to consumers without knowing how many rival bidders are actively competing in specific or general branded grocery products.

A PRICE DISCRIMINATION MODEL

Let there be a grocery sub-market: of $N + 1$ risk neutral grocers which submit and announce bids p_i to supply consumers. Each grocer has a marginal cost of c, or, with a probability independent for each grocer, infinity, which is increased only if the grocers capture consumers. Grocers with high marginal costs do not compete or exit general or specific product classes. The consumer buys grocery bundles at the best known prices and pays up to a reservation maximum of $P_{\max}$. If grocer i uses a mixed strategy we depict the distribution of prices as p_i; x represents the probability that a grocer exists but does not compete. The grocers announce bids simultaneously via advertising messages to supply branded products. It is now well known that there are no pure strategy Nash equilibria, unless x is 0 or 1. If x is zero, firms charge c; if $x = 1$, there are no rivals and all grocers exit specific product classes. This could be caused by disruptions to the supply chain.

If $x \in (0, 1)$ no viable unique price equilibrium is possible for $P > c$. If the two lowest prices that exist are not equal or, where all firms have minimum prices, a firm gains by increasing prices (the Edgeworth case). If the two lowest prices were equal, one grocer could cut price and gain market share. However, there is no equilibrium where $p_i = c$; this is the zero profits textbook Bertrand point, because firm raising price could get a surplus of $P_{\max} - c$ with probability of x^N. The equilibrium is now therefore in mixed strategies. Thus, the standard textbook version of the Bertrand Paradox is a false theorem (Klemperer 2000). Each firm picks price $> c$, but less than $P_{\max}$. Since any firm gains positive profits at $P_{\max}$ and wins with a probability of x^N, the range of strategies must be bounded by $(P, P_{\max})$, where $P > c$. A symmetric equilibrium for $N + 1 > 1$ exists where:

$$D(P) \sqrt[N]{1 - \left[\frac{x^N}{1 - x^N}\right]\left[\frac{P_{\max} - P}{P - c}\right]} \tag{1}$$

for the price range

$$[x^N P_{\max} + (1 - x^N)cP_{\max}] \quad \text{(see p. 130)}. \tag{2}$$

In this case profits are positive, but expected price and profits fall smoothly as the number of firms increases, as in Cournot. In this model the lowest bid wins consumers with certainty and still earns a profit. Risk averse sellers gain in this model by continually pushing prices down. High prices are a gamble in the hope that rivals are temporarily inactive.

AN ASYMMETRIC BERTRAND MODEL WITH TWO SELLERS: TYPE D AND TYPE P GROCERS

Proposition 1: Two sellers: type D stores are always competing, the type P grocers enter and exit product classes repeatedly.

$$P(c) = (1 - x) \quad \text{where } x \text{ is the probability of exit.} \tag{3}$$

Let both types of seller have different mixing distributions over $[Q, P_{\max}]$. The equilibrium is:

$$0 \quad \text{for} \quad p \leq (1-x)c + xP_{\max},$$

$$F_1(p) = 1 - \frac{x(P_{\max} - c)}{p - c} \quad \text{for} \quad p \in [(1-x)c + xP_{\max}, P_{\max}],$$

$$1 \quad \text{for} \quad p \geq P_{\max},$$

$$0 \quad \text{for} \quad p \leq (1-x)c + xP_{\max},$$

$$F_2(p) = 1 - \frac{x}{1-x}\frac{P_{\max} - p}{p - c} \quad \text{for} \quad p \in [(1-x)c + xP_{\max}, P_{\max}],$$

$$1 \quad \text{for} \quad p \geq P_{\max}.$$

Continuous price dispersion is the clear outcome for the asymmetric case when $p > c$. Implications of this auction model for sub-market grocer price strategies are as follows:

1. A continuous pure strategy for discounter is not sustainable in repeated plays if consumers search costs change due to, say, increased on-line shopping. Moreover, if due to demographic changes, new consumers enter the sub-market then the equilibrium strategies for both types of supermarket groups need to be mixed.
2. In particular, the discounters will need to use mixed strategies. In such situations, let the probability of not competing for previously segmented bundles of goods be – and indeed is – the probability of competing. The auction model identifies precise boundary conditions for this outcome. Hence repeated plays will induce greater sub-market price dispersion for the two groups as both utilise mixed strategies. The auction model clarifies this important point

as the two groups, being competitive bidders, perceive the game as an ascending and/or descending price auction in branded goods.

Price dispersion will not necessarily narrow even with new entry, as prices vary between $P_i > c$ but less than $P_{\max}$ for both types of store format. Hence third degree price discrimination is a probable strategy for both formats. This could be proved using the revenue equivalence theorem (Klemperer 2000).

Testable Hypotheses Derivable from the Models

The auction model permits the formulation of the testable hypothesis that demand and supply side uncertainties are a primary cause of price dispersion in grocery sub-markets. However, in this model, search costs faced by consumers create the opportunity for sellers to practise price discrimination. The possibility for price discrimination is caused by uncertainty in the market. All sellers adopt mixed strategies targeted at different consumer demand characteristics. Search constraints faced by consumers allow both types of seller to use mixed price strategies to induce periodic price oscillations, thus generating different degrees of price dispersion. An interesting research question implicit in the models concerns the degree to which consumer characteristics of search behaviour may determine store choice in the context of price discrimination. We approach this issue using logit analysis on primary data collected in the UK.

Testing Implications of the Models – Using Logit Analysis

THE DATA

The data were collected between 10 AM to 7 PM in Newcastle upon Tyne, Sunderland and Middlesborough central business districts through direct interview by researchers who approached consumers randomly. Buyers were asked a set of straight-forward questions regarding total weekly grocery expenditure, income, distances travelled for primary shopping, value for money perceptions, type of store preferred, and the most significant reason for choice of store format. Approximately 2000 people were approached, and a total 497 completed questionnaires were obtained. Of the incomplete questionnaires, approximately 603 people refused to give income details and the remainder would not divulge weekly expenditure levels. Nonetheless, the data obtained are rich, geographically diverse and comprehensive. The regressors to be used in

the logit analysis were tested for independence. The null hypothesis that there was no association between regressors X_1 to X_7 was rejected in all cases. This is consistent with theoretical propositions relating to differentiation, and in particular the predictions of Hotelling's (1929) oligopoly model. We now turn to consider the econometric model. From a consumer perspective, choice of a store depends upon whether the store is price-orientated or not, as this leads to expectations about relative price levels offered by different stores, as evident in the auction models. However, service levels and other aspects of the store environment are an issue creating product differentiation in consumer services and service quality levels.

THE MODEL AND RESULTS

To analyse the impact of different consumer characteristics in determining store choice, we conducted a logit analysis of the sample data. The objective was to predict the conditional probability of a consumer patronising either type of store given seven characteristics which are illustrated in Table 1. The following equation was estimated:

$$P(Y = 1|X_{1i}, \ldots, X_{7i}) = \frac{1}{1 + exp[-\{\beta_0 + \beta_1 X_{1i} + \cdots + \beta_7 X_{7i}\}]}.$$

The above series of classifications identifies 256 (i. e. 2^8) different types of consumer in the north-east of England. The objective here is to calculate the conditional probability that any one set of consumers choose either a type P or D store. It is important to note that each set of consumers is identified by seven characteristics. All characteristics must therefore be present for different consumer sets to be captured. Hence, the combination of all seven characteristics generates a unique class of consumers. We used the logit model to estimate these conditional probabilities. The model descriptors are given in Table 1. The estimation was carried out using Microfit 4, which has a well established routine for this purpose. The computer output consists of a table containing the estimated coefficients, T-ratios and 'goodness of fit' measures. These values are presented in Table 2. Following these points, it should be pointed out that an insignificant t value reported for a given regressor is not of any particular consequence, since we are not interested in any significant combination of these regressors. We are only interested in the combined influence of all regressors that jointly identify different sets of buyers. Our base run findings are given in Tables 3 and 4. However, by setting the regressors

Table 1: Consumer profiles in the UK north-east: Model Descriptors

Consumer characteristics	Status	Descriptions of variables	Input = 1	Input = 0
Y	Dependent	Choice of store	Discounter	Quality multiple
X_1	Independent	Distance to store	Equal to or less than 3 miles	Over 3 miles
X_2	Independent	Value for money by consumers	Both price and non-price expectations are met	Either price or non-price expectations are met
X_3	Independent	Firms are actively competing in identifiable classes of branded groceries	Price	Non-price factors; e. g. convenience, stock range, service, quality of products
X_4	Independent	Consumer type	Strategic buyers	Time-constrained
X_5	Independent	Level of income	Less than or equal to £16,000 per year	Over £16,000 per year
X_6	Independent	Means of transportation	On foot	Public or private transport
X_7	Independent	Store loyalty	Yes	No

X_1–X_7 at different levels permits an interesting set of simulations which can be compared with the base run. With respect to the base-run the 'goodness of fit' statistic and other diagnostics are sound (Table 2).

Summary of Simulations

Table 5 provides the statistic results from the simulations and the findings are summarised as the following:

1. When all are given equal locational distances, a positive change in signs X_5 (income) and a negative change in X_7 (loyalty) are observed, but both are insignificant.
2. Compared with the base case, when value criteria are all met, the only noticeable but insignificant changes are positive on income (X_5) and negative on store loyalty (X_7).
3. When all grocers compete on price factor, compared to the base run, it changes signs for distance (X_1), value (X_2), and means of trans-

Table 2: Logit Maximum Likelihood Estimation for Discount Stores: Base-Run Case

Dependent variable is Store Choice – 497 observations used			
Regressor	Coefficient	Standard Error	T-Ratio [Prob]
X_1	-.70603	.21851	-2.5888[.000]
X_2	-.76905	.19374	-3.9695[.000]
X_3	.58802	.22454	2.6388[.004]
X_4	.54369	.22468	2.4645[.004]
X_5	-.50669	.23297	-1.92967[.005]
X_6	-1.4100	.21249	-6.6357[.000]
X_7	.52646	.25663	2.1390[.005]
Marginal effects = .16112			
Goodness of fit = .79678			
Pseudo-R^2 = .30589			

The estimation method converged after 6 iterations

portation (X_6). This is a significant impact on the sign for consumer types (X_4).

4. When all consumers are strategic buyers, positive changes to incomes coefficient (X_5) are noticed and store loyalty dramatically falls.
5. When all consumers are on low incomes, all coefficients stay very similar but again store loyalty drops significantly compared to base case.
6. When consumers all have zero travelling costs, again income (X_5) and store loyalty (X_7) observably change the signs.
7. When there is repeated store switching, compared to base run, this changes the sign of the income coefficient.

The findings of base-run compared with simulations are summarised in Table 6 for comparative purposes. The consistency of the base findings with the simulated results for high probability cases is extraordinary. The base case characteristics of consumers who patronise discount stores are seen to be those who travel less than 3 miles, search for good value, perceive the store as competing in price, have low incomes and travel on foot to the store. They also exhibit high store loyalty. For the high probability cases there is a good degree of harmony between the base-run and the simulations. Thus, in these simulations, consumers who use discount

Table 3: Base-run of consumers profiles and probabilities of choosing discount stores

Probabilities	Consumers' profiles													
	Distance 3 miles residual		Value for money		Firms are actively competing in identifiable classes of branded goods		Consumer behavioural type		Income level at £16,000 *p. a.*		Means of transportation (costs incurred)		Store loyalty	
	>	<=	Yes	No	Non-price	Price	T. c.[1]	S. b.[2]	>=	<	Cars, etc	On foot	Yes	No
0.77871		*	*			*		*	*			*	*	
0.68676		*	*			*		*		*	*		*	
0.60858		*	*			*	*			*	*		*	
0.58478		*		*		*		*		*	*		*	
0.52049	*		*			*	*		*		*		*	
0.5		*	*		*		*		*		*			*
0.45487		*		*		*	*		*		*		*	
0.38265		*	*			*		*	*		*			*
0.25586		*		*		*		*		*		*		*
0.21889	*			*	*		*		*		*			*
0.1811		*		*	*			*	*			*		*
0.16035		*		*	*			*		*		*		*
0.1376		*		*	*			*	*		*			*
0.11928	*			*	*		*			*		*	*	
0.10165	*			*	*		*			*		*		*
0.095889	*			*		*	*			*	*			*
0.076697	*			*	*			*		*	*			*
0.05563	*			*	*		*			*	*			*

1. Time constrained consumer 2. Strategic buyers

Table 4: Base-run of consumers profiles and probabilities of choosing promotional stores

Probabilities	Consumers' profiles													
	Distance 3 miles residual		Value for money		Firms are actively competing in identifiable classes of branded goods		Consumer behavioural type		Income level at £16,000 *p. a.*		Means of transportation (costs incurred)		Store loyalty	
	>	<=	Yes	No	Non-price	Price	T. c.[1]	S. b.[2]	>=	<	Cars, etc	On foot	Yes	No
0.97297	*		*		*		*		*		*			*
0.96827	*		*		*		*		*		*		*	
0.94928	*			*	*		*		*		*		*	
0.932		*	*		*		*			*	*		*	
0.9215	*			*	*		*			*	*		*	
0.9029	*			*	*			*	*		*		*	
0.88968	*		*		*			*		*	*		*	
0.85239	*			*	*			*		*	*		*	
0.8318		*		*	*			*		*	*			*
0.8068		*		*	*			*		*	*		*	
0.77978	*			*		*	*		*			*	*	
0.7624	*			*		*	*			*	*			*
0.70358	*			*		*		*	*			*		*
0.65636	*			*		*		*	*		*		*	
0.58032	*		*		*		*			*		*	*	
0.5	*			*		*		*		*		*	*	
0.45886	*			*		*		*		*		*	*	

1. Time constrained consumer 2. Strategic buyers

Table 5: Results of Simulations on Each Variable; Coefficients and T-ratios

Coefficient	X_1*	X_2*	X_3*	X_4*	X_5*	X_6*	X_7*
X_1	−2.4211	−.25682	**.065416**	−.37271	−.26749	−.20416	−.31525
X_2	−.56811	−2.2108	**.19094**	−.51745	−.51901	−.60455	−.58748
X_3	1.4726	1.3588	1.7518	1.6312	1.4943	1.5010	1.5048
X_4	.94262	.89269	**−1.1405**	−1.7298	.99876	.93296	.92905
X_5	**.50905**	**.45390**	−.50610	**.64867**	−1.8872	.61875	**.51952**
X_6	−.46711	−.54512	**.53017**	−.52046	−.64258	.61875	−.51575
X_7	**−.10519**	**−.11539**	.23538	−.058869	**−.032405**	−.079572	−2.2172
T-Ratio [Prob.]							
X_1	−5.3720	−.76773	.20150	−1.1144	−.79297	−.61555	−.94004
	[.000]	[.443]	[.840]	[.266]	[.428]	[.538]	[.348]
X_2	−2.0181	−4.2221	.72642	−1.8713	−1.8616	−2.1572	−2.0896
	[.044]	[.000]	[.468]	[.062]	[.063]	[.031]	[.037]
X_3	5.5405	5.2908	3.4654	6.2179	.6090	5.6422	5.6501
	[.000]	[.000]	[.001]	[.000]	[.000]	[.000]	[.000]
X_4	3.4752	3.3075	−4.3561	−3.4309	3.7153	3.4434	3.4195
	[.001]	[.001]	[.000]	[.001]	[.000]	[.001]	[.001]
X_5	1.8780	1.6912	−1.9314	2.4367	−3.7357	2.3327	1.9138
	[.061]	[.091]	[.054]	[.015]	[.000]	[.020]	[.056]
X_6	−1.5885	−1.8361	1.8551	−1.7702	−2.2072	−6.1829	−1.7245
	[.113]	[.067]	[.064]	[.077]	[.028]	[.000]	[.085]
X_7	−.33819	−.37383	.79065	−.19160	−.10420	−.25521	−4.5640
	[.735]	[.709]	[.430]	[.848]	[.917]	[.799]	[.000]
Marginal effects	.12210	.12310	.134719	.12726	.12337	.12256	.12144
Goodness of fit	.82093	.81690	.81690	.81891	.82294	.83099	.82495

* Targeted variables; changing in sign indicated in bold case.

stores, are consistently revealed to be strategic buyers who perceive price competition as a key factor. This is true in all the simulations (Table 6). However, for the lowest probabilities cases, there is no consistency with the base run. For example, although store loyalty is high in the base run, it is not observed in the low probability cases. Thus, for example, store loyalty is low and most buyers are time-constrained. The use of the logit model for simulations is a powerful way of restating some results from the base run. Moreover, the simulations are a legitimate way to configure consumer characteristics when all the regressors are 'environmental' or not directly under the control of the firm. Use of logit analysis for sim-

ulation on variables under the firms' control would be inappropriate. The simulations create different computer generated sub-data sets of the base case. In a sense they are clones of the base run when one regressor is altered each time. In this way, consumer profiles are enriched.

Implications of the Findings

The findings of the logit model and simulations indicate significant features relating to consumers who patronise discount and quality grocers. Quality stores clearly have an advertising communications strategy which links directly to service levels and non-price factors which time-constrained buyers need. Consumers who regularly conduct primary shopping at discount stores are typically strategic buyers. The auction models predict that both stores are strategically positioned for price discrimination targeted on grocery sub-markets. Time-constrained buyers will on the basis of the logit model regard prices at quality stores as representing poor value for money compared to discount stores. A typical consumer profile for a discounter's consumer would be a strategic buyer who was price sensitive with an income level higher or lower than £16,000 p. a. A fundamental feature depicted in Tables 3 and 4 is that there is clear linkage between value for money, price as the most important reason for store choice and strategic buying clearly locating the grocery discounters sub-market base. This is clear from the simulations, too. By contrast, a quality store's customer base is defined by time-constraints rather than 'value-for-money' or price considerations. That said, there is high probability that a consumer using a quality store will perceive prices as being too high and 'value-for-money' low compared with a discounter. Hence the time-constrained consumers using quality stores trade off value for money and relatively high prices against high service levels and other aspects of vertical product differentiation. The findings in Tables 3 and 4 produce clear possibilities for third degree price discrimination in grocery sub-markets and provide an explanation of enduring price dispersion (Walsh and Whellan 1999). Indeed, the grocery sub-market price dispersions are endogenous to the auction model. Moreover, consumers who choose discount stores generally believe that these stores offer better 'value-for-money' than those consumers who normally use quality stores. This is true in the base run and the simulations. Paradoxically, enhanced price dispersion may be an outcome of increased new entry in grocery retailing. Inspection of Tables 3, 4 and 6 shows clear market segmentation built on the char-

acteristics of consumers and the potential for price discrimination. The simulations underline this, too. Critically, if search behaviour changes or time-constraints rise or fall then both types of format need to use mixed strategies or exit product lines periodically. This is clear from the auction model and is supported in the literature (Cotterill 1983, 1986, 1992).

The simulations using the logit model are a powerful tool for estimating differences in characteristics. Thus when all stores are given the same location details, the other coefficients are much of the same in terms of directional changes. When all stores in the sample are given value for money equivalence – when all compete in price – the change in the coefficients is marginal. Again when all consumers are strategic buyers with no time constraints, the main change is that store loyalty goes down.

Conclusions

Most spatial models have a single-dimensional feature on which sellers are placed (straight lines or cycles) about which consumers are distributed uniformly. The assumption in such models is that consumers differ in preferences with respect to a single good characteristic. In reality, grocery consumers may have different tastes and preferences over many sellers and goods characteristics. An exception to this is Palma et al. (1994) and others who have treated two or more characteristics of spatial price dispersion of market space and search costs within it using nested logit specifications. Our focus is on the effects of vertical and horizontal product differentiation on price equilibria and dispersion, in grocery sub-markets. One of our findings is that large sellers emphasising service quality and wide choice charge higher prices for wide ranges of branded groceries. This is at odds with the Palma et al. result (ibid). However, the findings of the logit are robust and point to consistency in findings between the base-run and the simulations (Table 6). The simulations consistently changed store loyalty, means of transportation, perceptions of value for money. The other coefficients are, in many cases, very similar. This is further evidence of the robustness of the logit model/developed.

Proof

$$D(P) = \sqrt[N]{1 - \left[\frac{x^N}{1 - x^N}\right]\left[\frac{P_{\max} - P}{P - c}\right]}. \tag{1}$$

For the price range $[x^N P_{\max} + (1 - x^N)cP_{\max}]$.

Table 6: A Comparison of Consistencies of the Base Run with the Simulations

		Characteristics						
		$X_1 < 3$ miles	X_2 – value	X_3 – firm competing on price	X_4 – strategic buyers	X_5 – income < 16,000	X_6 – means of travel	X_7 – store loyalty
	Highest probabilities							
Base-run	0.77871	✓	✓	✓	✓	✗	✓	✓
Simulation 1	0.62318	✓	✗	✓	✓	✓	✗	✓
Simulation 2	0.55917	✓	✓	✓	✓	✓	✗	✓
Simulation 3	0.72673	✓	✗	✓	✓	✓	✗	✓
Simulation 4	0.54422	✓	✗	✓	✓	✓	✗	✓
Simulation 5	0.5838	✓	✗	✓	✓	✓	✗	✓
Simulation 6	0.58883	✗	✗	✓	✓	✓	✓	✓
Simulation 7	0.60371	✓	✓	✓	✓	✓	✗	✗
	Lowest probabilities							
Original	0.05563	✗	✗	✗	✗	✓	✗	✗
Simulation 1	0.027611	✓	✓	✗	✗	✗	✓	✗
Simulation 2	0.041964	✓	✓	✗	✗	✗	✓	✗
Simulation 3	0.051048	✓	✓	✓	✗	✗	✓	✗
Simulation 4	0.039191	✓	✓	✗	✓	✗	✓	✗
Simulation 5	0.03394	✓	✓	✗	✗	✓	✓	✗
Simulation 6	0.027069	✓	✓	✗	✗	✗	✓	✗
Simulation 7	0.02569	✓	✓	✗	✗	✗	✓	✗

A Proof of the Simultaneous Symmetric Bertrand case

We hypothese that, with equilibrium existing in the range (P, P_{max}), the expected payoff to firm i, is from a pure strategy, $p_i = p$ is then:

$$\pi_i(p) = \sqrt{(x^N + (1 - r^N)(1 - f(p))^N [p - c]}. \tag{2}$$

Over this range *is equal for any price. When $P = P_{max}$

$$\pi_i(P_{\max}) = x^N (P_{\max} - c). \tag{3}$$

Since i, wins if and only if (iff) no other firm bids (except when other prices are $P_{\max}$ which has zero probability).

Equating (2) to (3):

$$\sqrt{(x^N + (1 - r^N)(1 - f(p))^N [p - c]} = x^N (P_{\max} - c), \tag{4}$$

which solved yields:

$$f(P) = \sqrt[N]{1 - \left[\frac{x^N}{1 - x^N}\right] \left[\frac{P_{\max} - P}{P - c}\right]}, \tag{5}$$

by definition P from (5).

$$0 = 1 - \left[\frac{x^N}{1 - x^N}\right] \left[\frac{P_{\max} - P}{P - c}\right], \tag{6}$$

which yields:

$$P = x^N P_{\max} + (1 - x^N)c. \tag{7}$$

The expected price that a firm charges is P' such that:

$$0.5 = f(P') = \sqrt[N]{1 - \left[\frac{x^N}{1 - x^N}\right] \left[\frac{P_{\max} - P'}{P' - c}\right]}, \tag{8}$$

which yields:

$$P' = \frac{c + (P_{\max} - c)x^N}{[1 - 0.5^N (1 + x^N)]}. \tag{9}$$

The expected π for ith firm is:

$$\pi_1 = (1 - x)x^N (P_{\max} - c). \tag{10}$$

Profit decline as N increases for individual firms.

Expected industry profit is therefore:

$$\sum_{i=1}^{N+1} = (N + 1)(1 - x)x^N (P_{\max} - c). \tag{11}$$

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Demand Functions for Services of Public Railway Passenger Transportation: An Empirical Analysis for Slovenia

Jani Bekő

The paper deals with the estimation of demand functions for services of public railway passenger transportation in the case of Slovenia. Six demand functions were selected and separately interpreted. The aggregate values of demand elasticities reported in this paper suggest that the railway passenger demand is price and income inelastic. Coefficients of income elasticity below unity show that the services of railway passenger transportation in Slovenia can be classified among normal goods. A hypothetical increase in average real fares leads to a percentage decrease in the number of passengers travelling by rail that is smaller than the percentage increase in fares. The estimated price elasticities imply that, in the short run, there is potential for improving revenues of the railway operator by increasing average real fares.

Introduction

In the literature we can find detailed descriptions of a range of factors and their specific characteristics (a variety of products offered by railway companies, complexity of the production process in railway transportation, and a business environment of the railway companies that is strongly affected by state regulations), which explain the dominant structural changes in railway transportation in either a comprehensive or a specific manner. However, there are fewer empirical estimates of the demand functions for services of railway passenger transportation that are directly based on chosen parameters of consumer behavior. The result of these analyses is the identification of the degree to which these services are attractive for average consumers with respect to prices and their income. The opinion is that the demand for services of different modes of transportation is typically inelastic, since transportation costs are relatively small in comparison with the value or utility of these services. But the estimates for the coefficient of income and price elasticity of demand for railway passenger services can also be heterogeneous. The outcomes

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of the studies depend on the specification of functions, the level of aggregation, and how stiff the competition is on the railway market and transportation market in general. Despite the fact that several empirical studies have confirmed relatively inelastic price and income demand for services of railway passenger transportation (Owen and Phillips 1987; de Rus 1990, Goodwin 1992, Oum et al. 1992, Luk and Hepburn 1993), one should not ignore the tendency toward the gradually increasing magnitude of coefficients of elasticity of demand that can be observed within a longer time horizon.

The article presents the estimates of responsiveness of demand for services of railway passenger transportation for chosen price and income elements in Slovenia. The theoretical concepts of price elasticity of demand are described in the second section of the paper. In the third section, we first classify the groups of variables that are used in the empirically oriented literature abroad. We then compare them with the characteristics of the currently available data base in Slovenia and, using methodological and content criteria, choose the set of data series to be used for estimation. Different specifications for the demand function for services of railway passenger transportation are delineated in the fourth section. In the fifth section we show the estimates, and we conclude with a summary of the key findings.

Concepts of Demand Elasticity

Economic theory distinguishes between two concepts of demand functions: ordinary demand function and compensated demand function (Nicholson 1995). From this division are usually derived two types of price elasticity of demand: ordinary and compensated elasticity of demand (Oum and Watters 2000). The ordinary demand function (Marshallian demand) is based on maximizing the consumer utility function, which is subject to the budget constraint. The Marshallian demand is formally set as follows:

$$X = d_X(P_X, P_Y, I, s, \epsilon),$$

$$\max U = u(X, s, \epsilon),$$

where X represents the quantity demanded, P_X the price of good X, P_Y is the vector of prices for other goods, I is available income, s is a vector of socio-economic factors (economic activity in home economy, international economic environment, type of market structure, etc.), ϵ is a vector of stochastic disturbances, and U utility of a consumer. In the demand function set up in this way, the change of P_X causes two effects: the

substitution and income effect. The substitution effect shows changes in the demand of individuals due to changes in the reference price, given the unchanged level of utility. The income effect comes about because the changes in the reference price change the real purchasing power of income, which affects the changes in the quantity consumed. The dynamics of this depend on the ratio of consumption to income.

Compensated demand (Hicksian demand) is based upon minimizing consumer expenditures (E) at a chosen level of utility. It can be formalized as follows:

$$X = h_X(P_X, P_Y, U, s, \epsilon),$$
$$\min E = e(I),$$
$$P_X \cdot X + P_Y \cdot Y = I.$$

Since the curve of compensated demand represents the relationship between the changing reference price and the quantity demanded with unchanged other prices and utility, the compensated elasticity of demand, unlike the ordinary elasticity of demand, shows only the substitution effect for chosen changes of prices along a given indifference curve.

Choosing between both concepts of elasticity for empirical analysis, and before that between the concepts of demand functions, is a question of their methodological suitability. The concept of the compensated demand function is appropriate to estimate, for example, consumer surplus. However, the availability of data on the dynamics of income and price variables allows for easier estimation of the ordinary demand function. The problem concerning compensated demand is also the utility function, which cannot be measured directly.

Demand functions for services of passenger transportation are usually formed under the assumption of a utility maximizing representative consumer, subject to his/her own budget constraint. Therefore almost all studies of the estimates for price elasticity of the demand for services of passenger transportation cite elasticity that simultaneously includes income and substitution effects, although the authors do not emphasize this and only rarely discuss the differences between the two concepts of elasticity (Oum et al. 1992; Oum and Watters 2000). This study estimating the demand functions for services of public railway passenger transportation for Slovenia is also along these lines.

Presentation of Data Base

In estimating the demand functions for services of public railway passenger transportation within the country, the authors usually include five

groups of explanatory variables, which can be divided into two classes.[1]

The first class comprises the variables with which we are trying to capture socio-economic factors. It is possible to distinguish among four groups of variables:

- price variables;
- income variables;
- seasonal factors;
- other socio-economic factors.

In the second class we place the group of variables that express qualitative components of the demand factors:

- frequency of arrivals and departures;
- saved travelling time in comparison with alternative modes of travel;
- quality of services that supplement the basic service (transportation).

The choice of the variables to be used from among a range of those theoretically recommended depends on the chosen methodological procedures of the estimation of demand function parameters, the level or aggregation in demand functions, and on available statistical data.

In the present paper we employed the widely used econometric method of ordinary least squares (OLS). This requires, among others, sufficient length of time series.

AVAILABLE TIME SERIES

The demand functions estimated in this study reach the highest level of aggregation since the dependent variable represents the total number of passengers transported by railway traffic in Slovenia.[2] The dependent variable is thus not disaggregated into different routes, groups of passengers and fare classes.[3] Because of the aggregate approach, we have to eliminate all the theoretically suggested variables from the second class. Introduction of the qualitative components requires the disaggregation of passengers according to different routes, which can be alternatively supplemented with disaggregation of the number of passengers into different groups (transportation to school, commuting to job, etc.). Thus we can use only socio-economic variables for the estimation of the equations, however we can choose among different time series (Table 1).

Table 1: List of available time series for different groups of independent variables

Price variables	Deflators	Income variables	Variables of seasonal factors	Variables of other socio-economic factors
Average fare	Railway passenger transportation price index (RPTPI)	Real gross domestic product	Dummy variables	Number of first-time registered personal cars
Average fare per passenger kilometre	Services price index (SPI)	Registered real household income		Prices of petrol
Railway passenger transportation price index (RPTPI)	Transportation price index (TPI)			Prices of representative personal cars
Price of tickets without discount for second class journeys (21–25 kilometres)	Transportation and communications price index (TCPI)			
Price of tickets without discount for second class journeys (36–40 kilometres)	Consumer price index (CPI)			

Note: The list of available data series was compiled using data of the Slovenian Railway Company, Statistical Office of the Republic of Slovenia and Bank of Slovenia. The income series were deflated by CPI.

There are two candidates for the dependent variables: the number of passengers transported and the number of passenger kilometres. From Table 1 it can be seen that within the available series none of the income and socio-economic variables is expressed in terms of passenger kilometres. Because of the chosen methodology of elasticity estimation (OLS), we cannot use the series 'number of passenger kilometres'.

Among the price variables we had to exclude the following variables: average fare per passenger kilometre, price of tickets without discount for second class journeys (average transport route 21–25 kilometres) and price of tickets without discount for second class journeys (average transport route 36–40 kilometres), since a comparable dependent variable is not available. Among available series for the price variable, the only suitable nominal category is the series railway passenger transportation price

index (RPTPI). The series average fare represents the non-weighted tolar revenue per transported passenger. Since this series is also in nominal terms, it is appropriate to calculate the real variable. When doing this we can choose among five deflators. Based on the nature of the problem, the most suitable are the consumer price index (CPI) and railway passenger transportation price index (RPTPI). We also introduce the transportation and communications price index (TCPI), transportation price index (TPI), and services price index (SPI). Based on the content, all additional deflators are placed within CPI, which is the most broadly based category, and RPTPI, which is the narrowest price category and is specially used also as a direct nominal price variable.

Concerning income variables, we can choose between real gross domestic product and registered real household income. The latter series comprises real net wages, other real receipts from employment and real transfer receipts. A priori we cannot decide between the two. However, taking into consideration the nature of the problem, the series of registered real household income is more appropriate. The final choice of income variables will be carried out on the basis of objective criteria of econometric analysis.

When analyzing passenger railway transportation, it is reasonable to expect seasonal influences. Simple graphical analysis of the time dynamics of the number of transported passengers shows that the number substantially declines in the summer (June, July and August) or in the second and third quarters. Estimating the elasticities we can address the seasonal influences in two ways:

- using dummy variables or
- seasonally adjusting the time series (multiplicative method X-11).

Based on a priori analysis of the content, we cannot exclude from analysis any of the socio-economic time series (number of first-time registered personal cars, prices of gasoline, prices of representative personal cars). The choice will therefore be based on the results of the econometric analysis.

USABLE TIME SERIES

We exclude several of the available time series based upon the limitations arising from the chosen method of estimation and content suitability. The set of available series can therefore be narrowed down to a set of usable series (Table 2). The series of this set satisfy content and

methodological criteria. Additionally we require that the following technical characteristics of the usable series be fulfilled:

- number of observations;
- frequency of the time series (monthly, quarterly);
- possible structural breaks recording data for certain series.

SERIES ACTUALLY USED IN ESTIMATION OF DEMAND FUNCTIONS

Since we have three groups of explanatory variables – income, price and variables for other socio-economic factors – we require at least 90 observations at a monthly level, which corresponds to 30 observations at a quarterly level. The time series also should not contain structural breaks. Additionally we require stationarity of time series in order to prevent possible spurious regressions when estimating the equations.

Based on these criteria, we can choose the set of time series from Table 2 that satisfies methodological and content criteria and technical characteristics, and is therefore suitable for estimating the demand functions for services of railway passenger transportation. The set of the time series suitable for econometric estimation is given in Table 3.

The dependent variable (Q) covers the period 1993M1–2002M7. The same is true for both income variables (I_1 and I_2), series P_7 for price variable and series O_2 for the variable of other socio-economic factors. The other price variable P_1, P_2, P_3, P_4, P_5 and P_6 covers the period 1994M1–2002M7. Two groups of series can be derived from the available time series. In the first group we place the monthly series for the period 1994M1–2002M7. In the second group are quarterly series that cover 1994Q1–2002Q2.

Specification of Demand Functions for Services of Public Railway Passenger Transportation

Following empirical analyses (Owen and Phillips 1987; Oum 1989; de Rus 1990; Oum et al. 1992), we chose the following specification of the demand function for services of public railway passenger transportation:

$$Q = \beta_1 \cdot I^{\beta_2} \cdot P^{\beta_3} \cdot O^{\beta_4} \cdot exp\left(\sum_{t=5}^{15} \beta_t \cdot D\right).$$

The specification was used on monthly time series and tackles seasonal influences through the use of dummy variables. The mathematical specification of this kind is not directly applicable for econometric estimation

Table 2: List of usable time series

Symbol	Series name	Number of observations	Frequency	Break	Time period
Q	Number of passengers transported	115	Monthly	...	1993M1–2002M7
I_1	Real gross domestic product	115	Monthly	...	1993M1–2002M7
I_2	Registered real household income	115	Monthly	...	1993M1–2002M7
P_1	Average nominal fare	103	Monthly	...	1994M1–2002M7
P_2	Average real fare (deflator SP1)	103	Monthly	...	1994M1–2002M7
P_3	Average real fare (deflator TP1)	103	Monthly	...	1994M1–2002M7
P_4	Average real fare (deflator TCP1)	103	Monthly	...	1994M1–2002M7
P_5	Average real fare (deflator RPTP1)	103	Monthly	...	1994M1–2002M7
P_6	Average real fare (deflator CP1)	103	Monthly	...	1994M1–2002M7
P_7	Railway passenger transportation price index (RPTP1)	115	Monthly	...	1993M1–2002M7
O_1	Number of first-time registered personal cars	67	Monthly	...	1997M1–2002M7
O_2	Average retail price of lead-free 95-octane petrol	115	Monthly	...	1993M1–2002M7
O_3	Average retail price of lead-free 98-octane petrol	115	Monthly	...	1993M1–2002M7
O_4	Average retail price of leaded 98-octane petrol	114	Monthly	...	1993M1–2002M6
O_5	Average retail price of lead-free 91-octane petrol	48	Monthly	...	1993M1–1996M12
O_6	Average retail price of representative car Renault 5	48	Monthly	...	1993M1–1996M12
O_7	Average retail price of representative car Renault Clio	67	Monthly	1999M1	1997M1–2002M7
O_8	Average retail price of representative car VW Polo	67	Monthly	1999M1	1997M1–2002M7

Note: For easier understanding of the specification of regression equations of demand for railway passenger transportation we added symbols to the listed variables. We used the following symbols: Q – quantity of demand, I – income, P – price, and O – other socio-economic variables. Since for some variables several series are available, we also added numbered subscripts to the letters.

Table 3: List of actually used time series

Symbol	Series name	Number of observations at monthly level	Number of observations at quarterly level	Time period
Q	Number of passengers transported	115	38	1993M1–2002M7
I_1	Real gross domestic product	115	38	1993M1–2002M7
I_2	Registered real household income	115	38	1993M1–2002M7
P_1	Average nominal fare	103	34	1994M1–2002M7
P_2	Average real fare (deflator SPI)	103	34	1994M1–2002M7
P_3	Average real fare (deflator TPI)	103	34	1994M1–2002M7
P_4	Average real fare (deflator TCPI)	103	34	1994M1–2002M7
P_5	Average real fare (deflator RPTPI)	103	34	1994M1–2002M7
P_6	Average real fare (deflator CPI)	103	34	1994M1–2002M7
P_7	Railway passenger transportation price index (RPTPI)	115	38	1993M1–2002M7
O_2	Average retail price of lead-free 95-octane petrol	115	38	1993M1–2002M7

Note: The stationarity of all selected variables was checked by DF test.

of individual coefficients, since the function is not linear in parameters. However, this condition can be satisfied by taking logs of the above equation.

In what follows we present four different variants of theoretical specifications of the regression equations.

Equation 1: Regression equation – monthly data and using dummy variables

$$\begin{aligned}\ln(Q^m) &= \ln(\beta_1) + \beta_2 \ln(I_r^m) + \beta_3 \ln(P_r^m) + \beta_4 \ln(O_r^m) \\ &\quad + \beta_5 D_6 + \beta_6 D_7 + \beta_7 D_8 + u\end{aligned}$$

Symbol:
Q^m – number of passengers transported per month
I_r^m – rth income variable, monthly
P_r^m – rth price variable, monthly
O_r^m – rth variable for other socio-economic factors, monthly
D_6 – dummy variable for seasonal component in June
D_7 – dummy variable for seasonal component in July
D_8 – dummy variable for seasonal component in August
$\ln(\beta_1)$ – regression constant
$\beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ – partial regression coefficients
u – random variable.

Equation 2: Regression equation – monthly seasonally adjusted series

$$\ln(QSA^m) = \ln(\beta_1) + \beta_2 \ln(ISA_r^m) + \beta_3 \ln(PSA_r^m) + \beta_4 \ln(OSA_r^m) + u$$

Symbol:
QSA^m – number of passengers transported per month (seasonally adjusted)
ISA_r^m – rth income variable, monthly (seasonally adjusted)
PSA_r^m – rth price variable, monthly (seasonally adjusted)
OSA_r^m – rth variable for other socio-economic factors, monthly (seasonally adjusted)
$\ln(\beta_1)$ – regression constant
$\beta_2, \beta_3, \beta_4$ – partial regression coefficients
u – random variable.

Equation 3: Regression equation – quarterly data and using dummy variables

$$\ln(Q^q) = \ln(\beta_1) + \beta_2 \ln(I_r^q) + \beta_3 \ln(P_r^q) + \beta_4 \ln(O_r^q) + \beta_5 D_2 + \beta_6 D_3 + u$$

Symbol:
Q^q – number of passengers transported per quarter
I_r^q – rth income variable, quarterly
P_r^q – rth price variable, quarterly
O_r^q – rth variable for other socio-economic factors, quarterly
D_2 – dummy variable for seasonal component in second quarter

D_3 – dummy variable for seasonal component in third quarter
$\ln(\beta_1)$ – regression constant
$\beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ – partial regression coefficients
u – random variable.

Equation 4: Regression equation – quarterly seasonally adjusted series

$$\ln(QSA^q) = \ln(\beta_1) + \beta_2 \ln(ISA_r^q) + \beta_3 \ln(PSA_r^q) + \beta_4 \ln(OSA_r^q) + u$$

Symbol:
QSA^q – number of passengers transported per quarter (seasonally adjusted)
ISA_r^q – r$^{\text{th}}$ income variable, quarterly (seasonally adjusted)
PSA_r^q – r$^{\text{th}}$ price variable, quarterly (seasonally adjusted)
OSA_r^q – r$^{\text{th}}$ variable for other socio-economic factors, quarterly (seasonally adjusted)
$\ln(\beta_1)$ regression constant
$\beta_2, \beta_3, \beta_4$ – partial regression coefficients
u – random variable.

Estimation of the Demand Functions for Services of Public Railway Passenger Transportation

For estimation of parameters for the functions specified in previous section, we used the method of ordinary least squares. The choice of the method is appropriate because all the specified equations are linear in parameters, the chosen method is relatively simple to use and assures (given that certain conditions are satisfied) ideal statistical properties.

Using the time series, the method produces unbiased and best estimates if the estimated regression equation does not show autocorrelation (this means that there is no systematic component in the variable that measures the random deviations) and if the explanatory variables are not linearly related. The latter is related to the level of precision of the estimates, which is an important criterion when estimating elasticity. In order to be able to use classical approaches of statistical testing when checking for the mentioned requirements, it is necessary that the residuals of the regression model be distributed normally. To this we add a condition that the estimated regression coefficients be statistically significantly different from zero, which is checked with exact levels of signifi-

Table 4: List of econometric tests used

Requirement	Test
Stationarity of time series	DF test with constant, and with constant and trend
Distribution of residuals	JB test of normality
Autocorrelation	LM test for first-, second-, fourth-, sixth and twelfth-order autocorrelation
Significance of coefficients	*p* values, *t* statistic, confidence intervals
Stability of estimates	Inclusion of different deflators, Cusum and Cusum Q test
Specification of regression equations	RESET test
Explanatory power of equations	Adj. R^2 and F test

cance (*p* values). Besides this the explanatory power of individual regression equations was also considered.

For the estimated regression equations that satisfied the mentioned criteria we investigated the suitability of the specification (RESET test), the confidence intervals for regression coefficients and their stability (Cusum and Cusum Q test).

Most of the estimated variants of regression equations are related to the use of different price variables, which are the result of deflating with different price indicators. Therefore, among those with similar results, we considered the ones where the chosen deflator best matched the content criteria.

ESTIMATES

Taking into account a number of different time series for measuring individual variables, two modes of including the seasonal components and two types of time frequencies (monthly and quarterly), the total number of regression equations that can be estimated is equal to 112. It turns out that estimated regression equations for monthly data do not fulfill the condition of normal distribution of residuals (56 equations). For 28 of the equations that are based on quarterly series, the inclusion of the variable for other socio-economic factors worsens the precision of the estimates (it increases the degree of linear relationship among explanatory variables). Seven regression equations, which are based on seasonally adjusted quarterly data and include real gross domestic product as the income variable, have too weak explanatory power. Thus there are

21 specifications, based on quarterly data, which are suitable for analysis. Of these, fourteen include dummy variables to capture seasonal components, and seven of them are estimated using seasonally adjusted data.

Most of these 21 variants of regression equations are linked to the use of five deflators when calculating the price category of average real fares. We found that the use of different deflators does not cause important differences in estimates of point elasticity. Therefore, based on the content criterion, we decided to use both marginal deflationary indices and to include the following six estimated specifications in the final analysis:[4 5]

$$\text{E1} \quad \ln(Q^q) = \ln(\beta_1) + \beta_2 \ln(I_1^q) + \beta_3 \ln(P_5^q) + \beta_4 D_2 + \beta_5 D_3 + u$$

$$\text{E2} \quad \ln(Q^q) = \ln(\beta_1) + \beta_2 \ln(I_1^q) + \beta_3 \ln(P_6^q) + \beta_4 D_2 + \beta_5 D_3 + u$$

$$\text{E3} \quad \ln(Q^q) = \ln(\beta_1) + \beta_2 \ln(I_2^q) + \beta_3 \ln(P_5^q) + \beta_4 D_2 + \beta_5 D_3 + u$$

$$\text{E4} \quad \ln(Q^q) = \ln(\beta_1) + \beta_2 \ln(I_2^q) + \beta_3 \ln(P_6^q) + \beta_4 D_2 + \beta_5 D_3 + u$$

$$\text{E5} \quad \ln(QSA^q) = \ln(\beta_1) + \beta_2 \ln(ISA_2^q) + \beta_3 \ln(PSA_5^q) + u$$

$$\text{E6} \quad \ln(QSA^q) = \ln(\beta_1) + \beta_2 \ln(ISA_2^q) + \beta_3 \ln(PSA_6^q) + u$$

A summary of estimates of all six functions is presented in Table 5.[6]

DISCUSSION OF RESULTS

The results of point and interval estimates of price and income elasticities, based on models E1–E6, are presented in part A of Table 5. The outcomes of the analysis can be summarized with the following conclusions:

- Point estimates of price elasticity of equations E1 and E2 are –0.2045 and –0.2032. Based on the calculations we infer that an increase in the average real fare by 1% will be followed by on average an approximately 0.20% decrease in the quantity of demand for services of railway passenger transportation. The low values of standard errors of the regression coefficient estimates for average real fares contribute to a satisfactory width of confidence intervals for the reference price elasticities.

Table 5: Empirical results

	A				
Equation	Point estimates of price elasticity	Point estimates of income elasticity	Confidence intervals for price elasticity	Confidence intervals for income elasticity	Confidence intervals for price elasticity, differences
E1	−0.2045	0.9286	[−0.3781, −0.0309]	[0.5211, 1.3360]	0.3472
	(−2.9015)*	(5.6104)*			
	(0.0070)**	(0.0000)**			
E2	−0.2032	0.9273	[−0.3870, −0.0193]	[0.4957, 1.3589]	0.3677
	(−2.7208)*	(5.2894)*			
	(0.0109)**	(0.0000)**			
E3	−0.3586	0.4319	[−0.6274, −0.0897]	[0.2181, 0.6457]	0.5377
	(−3.2837)*	(4.9737)*			
	(0.0027)**	(0.0000)**			
E4	−0.3966	0.4628	[−0.6969, −0.0964]	[0.2240, 0.7016]	0.6005
	(−3.2520)*	(4.7719)*			
	(0.0029)**	(0.0000)**			
E5	−0.3681	0.4375	[−0.6259, −0.1104]	[0.2325, 0.6425]	0.5155
	(−3.5021)*	(5.2334)*			
	(0.0014)**	(0.0000)**			
E6	−0.4061	0.4684	[−0.6951, −0.1171]	[0.2385, 0.6982]	0.5780
	(−3.4451)*	(4.9969)*			
	(0.0017)**	(0.0000)**			

Note: for explanation see note 6 on page 152.

- For equations E1 and E2 the calculated point estimates of income elasticities are 0.9286 and 0.9273. An increase in real gross domestic product by 1% thus causes an increase in the quantity of demand for services of railway passenger transportation of about 0.93%. Both coefficients of partial elasticities are statistically significant. However, they have relatively wide confidence intervals, which shows bad precision of the point estimates.
- Estimates of price elasticities in equations E3 and E4 increase in comparison with point estimates from equations E1 and E2. Also the interval estimate of price elasticity parameters increases, which suggests a relative worsening of the precision of point estimates.

		B		C	D	E	F
Confidence intervals for income elasticity, differences	LM(1)	LM(2)	LM(4)	Adj. R^2	RESET test	Cusum and Cusum Q test	JB test
0.8149	0.0012	0.1566	1.6729	0.9686	0.0015	+	0.5548
	(0.9721)	(0.9247)	(0.7956)	(0.0000)	(0.9698)		(0.7577)
0.8632	0.0000	0.1676	1.3513	0.9677	0.0130	+	0.7463
	(0.9945)	(0.9196)	(0.8526)	(0.0000)	(0.9099)		(0.6886)
0.4276	0.6334	0.6405	1.7858	0.9647	0.0875	+	1.5761
	(0.4261)	(0.7260)	(0.7751)	(0.0000)	(0.7695)		(0.4547)
0.4776	1.0390	1.1259	2.1352	0.9645	0.2484	+	1.0838
	(0.3081)	(0.5695)	(0.7109)	(0.0000)	(0.6221)		(0.5816)
0.4100	0.8198	0.8510	2.2102	0.7281	5.4809	+	0.8419
	(0.3652)	(0.6534)	(0.6972)	(0.0000)	(0.0261)		(0.6564)
0.4597	1.2137	1.2151	2.4055	0.7256	5.9878	+	0.3354
	(0.2706)	(0.5447)	(0.6616)	(0.0000)	(0.0205)		(0.8456)

From the results it follows that increasing average real fares by 1% will on average be followed by a 0.36% or 0.40% lowering of the quantity of demand for services of railway passenger transportation.

- In equations E3 and E4 the series registered real household income replaced the real gross domestic product. The point estimates of income elasticity are lower and more precise compared to the ones in equations E1 and E2, since the confidence intervals are now approximately half the previous ones. Based on the income elasticity estimates from equations E3 and E4, we can conclude that the number of passengers transported on average increases by 0.43% or 0.46%

if the registered real household income increases by 1%, all other elements being unchanged.

- In equations E3 and E4 considering the confidence intervals, the precision of the income elasticity estimates improved, but the precision of the price elasticities worsened in comparison with those from equations E1 and E2. For an additional check of the magnitude of income and price elasticities we seasonally adjust the time series that are used for estimating equations E3 and E4, and use them for estimating E5 and E6.
- Point and interval estimates of price and income elasticities in equations E5 and E6 are very similar to those from equations E3 and E4. If the registered real household income increases by 10%, the demand for services of railway passenger transportation on average increases by 4.4% (equation E5) or 4.7% (equation E6). The parameters for variable real fares suggest that a 10% increase in average real fares would cause a contraction of demand for services of railway passenger transportation on average by 3.7% (equation E5) or 4.1% (equation E6).

We can base our judgment of the explanatory power of estimated regression equations on the value of adjusted coefficients of determination. It turns out that all equations show satisfactory explanatory power: 73% or 97% of variance in the number of railway transport passengers can be explained by the combination of variables that are included in the six model specifications. The results of the Breusch-Godfrey test of autocorrelation testify that none of the estimated models displays autocorrelation in the residuals of the regression equations.

The results of the RESET test (part D of Table 5) warn us about the possibility of omitting an important explanatory variable from equations E5 and E6 (despite their satisfactory explanatory power, which is seen in part C of Table 5). Taking into account the results of testing for the presence of autocorrelation and the outcomes of specification tests of equations E3 and E4, we think that the outcome of the RESET test for equations E5 and E6 is mostly due to seasonally adjusted series and not directly to the incorrect specification of the regression equations. All the estimated coefficients of elasticity from equations E1, E2, E3, E4, E5 and E6 are structurally stable at an acceptable level of significance ($\alpha = 0.05$). We close the presentation of the content of econometric tests in Table 5 by checking the distribution of residuals for the chosen equations. The

results derived from the Jarque-Bera test conclusively confirm that the residuals are normally distributed from all regression equations.

Conclusion

Taking into account the estimates of demand functions for services of railway passenger transportation in Slovenia, we can conclude that it is price and income inelastic. Coefficients of income elasticity of demand below unity show that for the average consumer, the services of railway passenger transportation can be classified among normal goods, i. e. among essential consumer expenditures.

For the case of increased average real fares, the number of transported passengers by rail decreases in percentage terms by less than the fare actually increases (in percentage terms). The recorded price inelasticity of demand leads us to conclude that revenues of the railway operator increase when the average real fare increases.

We consider that the presented estimates of elasticity, and the conclusions derived from them, offer useful suggestions for setting the comprehensive price policy for public railway passenger transportation in Slovenia. The presented coefficients of elasticity are a result of the estimation of the aggregate demand functions. Therefore it would be sensible to expand the current analysis in the future by comparable testing of demand functions for services of railway passenger transportation according to individual fare classes or according to different categories of tickets sold.

Notes

1. The list of theoretically justified variables when specifying the equation of demand for services for railway passenger transportation was compiled on the basis of the following studies: Owen and Phillips (1987), Oum (1989), de Rus (1990), Goodwin (1992), Oum et al. (1992) and Wardman et al. (1997).
2. The choice of the dependent variable (the total number of transported passengers) is discussed below.
3. At the moment the computer processing of passengers in all fare classes in Slovenia amounts to between 67% and 74% of all passengers transported by railway. This incomplete treatment allows only for estimation of aggregate functions.
4. For the definition of variables see Table 3, and for the meaning of elements in specification see pp. 143–145.
5. Results of the estimation of price elasticities, derived from the other three deflators, are available upon request from the author.

6. In part A are the point and interval estimates of price and income elasticities. Below point elasticities in parentheses, marked by *, are *t* statistics, below *t* statistics in parentheses, marked by **, are *p* values. Interval estimates are calculated at the significance level 0.01. In part B are values for the Breusch-Godfrey LM tests, values in parentheses are *p* values. Adj. R^2 are in part C with *p* values in parentheses. Results of RESET tests are given in part D (F statistics and *p* values in parentheses). In part E are the results of Cusum and Cusum Q tests with the level of significance 0.05. A+ indicates structural stability of estimated parameters. JB tests of normality with *p* values in parentheses are listed in part F.

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Analysis of the Nature of Economic Growth of Slovenian Economy

Matjaž Novak

The aim of this article is to outline the economic growth for the Slovenian economy between 1992–2001. Our major interest is the nature of the past growth. Was it intensive or extensive? On the basis of four groups of different arguments we were expecting that there would be a predominantly extensive economic growth. In order to answer this question we developed an empirical study, which follows the conventional neo-classical growth accounting framework.

First we estimated three mathematical specifications of aggregate production functions. The analysis was than conducted through an econometric analysis of these estimates. Using these results we developed the growth accounting equation, which allowed us to compute the contributions of each particular input (physical capital, human capital and technical progress) to output growth.

On base of our received empirical results we are able to state, that the past economic growth of the Slovenian economy was significantly extensive.

Introduction

In the Slovenian economy from 1990 on there was an intensive process of accepting new concepts of economic actions in the direction from a semi command toward a market economy. This fact raises questions about the nature of economic proceses: production, distribution, export intensity and structural adjustment. The basic process from which all other forms come is production, whose characteristics are described by the aggregate production function.

The comparative empirical analyses of aggregate production functions between developed industrial economies and developing countries, which were made from 1950 till 1990, called attention to the fact that there exist completely different characteristics of the basic production processes on aggregate level between the compared groups of countries. The first group of countries feature an intensive economic growth, while the economic growth in developing countries (second group of economies) is rather extensive.

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After a period of fully ten years, since the transition process in the former centrally planned economies started, the question about the characteristics of the economic growth is also interesting for transition countries. We are especially interested in finding out how successful[1] were the transition economies in using available resources. How did they solve the basic economic problems of scarce resources? Is economic growth in these countries mainly extensive or intensive? Which production factor in this process was more important: physical capital, human capital or the sources of technical progress (Total Factor Productivity – TFP)?

We will find the answers to these questions trough an ex post analysis of the aggregate production function of the Slovenian economy.

Hypothesis

No common answer could be found to the nature of economic growth for transition economies. Therefore, we do not have any common pattern whose validity we could use for testing purposes for the selected economy (Slovenia). But in spite of all that, we can expect a predominantly extensive economic growth.

There are four groups of reasons, which justify our hypothesis:

- The growth rate of gross domestic product in transition economies was on the average higher than in the developed economies (Campos in Corricelli 2002).
- In the transition period this growth was mainly financed through foreign direct investments (Kudina 1999).
- Different national governments tried to reduce the pressure of unemployment and so made greater efforts to increase the use of labor (Blanchard et al. 1992).
- Typical for all economies in transition is the improved educational structure of the population. This has a large influence on the increase of human capital, which is also an important production factor (Jeffries 1993; Ayers et al. 1996; Sjögren 1998; Friere-Seren 2001).

The high economic growth is therefore connected with an intensive use of production factors. But was the use of these resources the main source of growth as we suppose? An empirical analysis will prove the facts.

Methodology

We will examine the characteristics of basic economic processes[2] at the aggregate level with the help of two analytical instruments, which means realizing our empirical research in two steps. First we examined the characteristics of the production process in the Slovenian economy, which can be deduced from econometric estimations of aggregate production functions. In the second step we evaluated the growth accounting equation, which presents how much of the output growth can be attributed to each particular production factor.

If we want to construct the growth accounting equation on the basis of the estimated parameters of aggregate production functions, we have to consider the restriction that the estimated parameters satisfy the conditions of efficiency and structural stability. When analysing these conditions we will use the procedure of statistical inferences. Following these results we can choose the most suitable mathematical specification of aggregate production function for developing the growth accounting equation.

Theoretical Background

AGGREGATE PRODUCTION FUNCTION

The production function defines the technical connection between used inputs (capital, labour) and output. The researcher has to be aware of the fact that using the production function as an analytical instrument bears a decisive influence upon the specification of the variables, from criteria, which have to be fulfilled by the valuation, and from the choice of an adequate mathematical specification.

In our case we shall use the aggregate production function as an instrument of an ex post analysis of the basic economic process at the aggregate level. The definition of variables and mathematical specification of equations must be subordinated to this aim.

Definition of Variables

A theoretical (non-deterministic) specification of the aggregate production function is based on two production factors and the efficiency parameter:

$$Q = f(K, L, A)$$

Symbols:

Q – output,

K – capital,
L – labour,
A – efficiency parameter.

In an ex post analysis we are interested in finding out how many disposable production factors the economy used in the past in order to produce a calculated quantity of gross domestic product. We are therefore calculating the use of production factors and not the disposable capacities. Along with these criteria we also have to consider the restrictions, which are related to disposable empirical data from the national statistics bureau.

Considering these restrictions the discussion in Novak (2003) shows that the series of labour may express the use of human capital, the series of capital payments for investments, and that the efficiency parameter should present Hick's definition of the neutral technical progress. The non-deterministic (common) formulation of the aggregate production function used in our analysis is defined as follows:

$$Q = A \cdot f(INV, HL)$$

Symbols:
Q – gross domestic product,
A – efficiency parameter,
INV – physical capital,
HL – human capital.
Source: own specification.

Mathematical Specification of Aggregate Production Function

Next we have to construct a mathematical (deterministic) specification of the aggregate production function. In economic analysis the Cobb-Douglas production function is often used. This function exhibits constant returns to scale. The partial coefficients of this function are at the same time the elasticity coefficients.

The Cobb-Douglas function:

$$Q = A \cdot K^{\alpha} L^{(1-\alpha)}$$

Symbols:
Q – product,
A – efficiency parameter,
K – capital,
L – labour,
α – elasticity of product with respect to capital,

$(1 - \alpha)$ – elasticity of product with respect to labour.
Source: Humphrey (1997, 52).

Beside the Cobb-Douglas specification, the universal form of power function is also used in economic analysis. This form does not exhibit linear homogeneity apriori.

Universal specification of power function:

$$Q = A \cdot K^{\alpha} L^{\beta}$$

Symbols:
Q – product,
A – efficiency parameter,
K – capital,
L – labour,
α – partial elasticity of product with respect to capital,
β – partial elasticity of product with respect to labour.
Source: own specification.

The dilemma occurred with the question about the unitary elasticity of substitution, which is inherent to both the Cobb-Douglas function and universal specification of power function. The group of authors mentioned in the literature as ACMS (Arrow, Chenery, Minhas, and Solow 1961, 225–250) designed the new form of the neo-classical production function – the CES[3] production function.[4]

CES function:

$$Q = A \left[\delta K^{-\psi} + (1 - \delta) L^{-\psi} \right]^{\frac{\rho}{-\psi}}$$

Symbols:
Q – product,
A – efficiency parameter,
K – capital,
L – labour,
δ – distributon parameter $(0 \leq \delta \leq 1)$,
ψ – parameter of substitution $(\psi \geq 1)$,
ρ – parameter of homogeneity.
Source: Guarda (2000, 52–53).

The three mathematical specifications described are often subjects of theoretical and empirical analyses and will be therefore used in our empirical research.

Empirical Claims of Estimated Parameters

Consider the fact that the estimation of the aggregate production function is only the starting-point of developing the given study of our empirical work and that our final goal is to construct the growth accounting equation. But which of the presented mathematical specifications can be used further on in the empirical work? This depends on the selected criteria.

Antras (2000, 10–15) mentions three conditions to be fulfilled by the estimated production function when using it in the growth accounting framework.

- The first criterion is connected with the goodness of fit of the estimated regression line.
- The second condition refers to the statistical significance of the partial regression coefficients. As they are the constitutional part of the growth accounting equation, it is recommended that they be statistically significant.
- The third criterion requires that the estimated production function does not contain a statistically significant structural break. The structural stability of the estimated parameters would signify that the role of individual production factors is not different in various periods. Therefore it is acceptable to establish a growth accounting equation for the whole period, because the characteristics of the productions are unique for the whole pattern of observation. According to the content it would be correct to make conclusions about extensive or intensive growth on the basis of results received in this way.

GROWTH ACCOUNTING EQUATION

Having estimated the parameters of selected aggregate production functions we can set up the growth accounting equation. By calculating the parameters of this equation we can analyse the contribution of individual factors to the economic growth as we determine what part of the production growth can be explained by the growth of used human capital, physical capital and what part is attributed to the growth of total factor productivity (TFP). When analysing the contribution of production factors to the economic growth our attention is directed to the changes of the dependent variable in connection with the changes depending on the

marginal changes of all explanatory variables. The conventional instrument for this analysis is the mathematical tool of a total differential.

From the specification of the production function $Q = A \cdot f(K, L)$ we can (by mathematical manipulation) set up the growth accounting equation:

$$q = \epsilon_{Q,A} \cdot a + \epsilon_{Q,K} \cdot k + \epsilon_{Q,L} \cdot l$$

Symbols:
q – growth rate of aggregate product,
$\epsilon_{Q,A}, \epsilon_{Q,K}, \epsilon_{Q,L}$ – partial elasticity coefficients,
a – growth rate of total factor productivity,
k – growth rate of capital,
l – growth rate of human capital.
Source: Valdés (1999, 88–90).

Following the neo-classical theory we assume, that the production factors are paid marginal products. Thus we can set up from the growth accounted equation the quantification of the contributions of the individual factor to output growth:

$$\frac{q}{q}\frac{\epsilon_{Q,A} \cdot a}{q} + \frac{\epsilon_{Q,K} \cdot k}{q} + \frac{\epsilon_{Q,L} \cdot l}{q} \Rightarrow$$

$$1 = \frac{\epsilon_{Q,A} \cdot a}{q} + \frac{\epsilon_{Q,K} \cdot k}{q} + \frac{\epsilon_{Q,L} \cdot l}{q}$$

Symbols:
$\epsilon_{Q,A} \cdot a/q$ – contribution of technical progress to output growth,
$\epsilon_{Q,K} \cdot k/q$ – contribution of capital input to output growth,
$\epsilon_{Q,L} \cdot l/q$ – contribution of human capital input to output growth,
Source: Valdés (1999, 88–90).

Results from Econometric Estimation and Analysis

Econometric estimation was made with the help of the Eviews software. With the ordinary least squares estimator we estimated the parameters of Power, Cobb-Douglas and CES specification of the aggregate production functions.

DATA USED

To measure the dependent variable (output) we have chosen the gross domestic product (1995 tolars). Capital is measured by payments for investments (1995 tolars). We have received all data from Statistični urad Republike Slovenije (SURS) and from Agencija Republike Slovenije za

plačilni promet (ARSPP). Variable labour was measured in units of effective labour – we calculated the series.[5] The database included 37 observations for the period 1992Q1–2001Q1.

REGRESSION EQUATIONS

The linearized regression equations of the chosen production functions were defined as:

- Power function:

$$\ln(BDP_t) = \ln(b_1) + b_2 \cdot \ln(INV_t) + b_3 \cdot \ln(EFD_t) + \epsilon_t$$

- Cobb-Douglas specification:

$$\ln(BDPefd_t) = \ln(b_1) + b_2 \cdot \ln(INVefd_t) + \epsilon_t$$

- CES function:

$$\ln(BDP_t) = \ln(b_1) + b_2 \cdot \ln(INV_t) + b_3 \cdot \ln(EFD_t) + b_4 \cdot \ln(INVefd2_t) + \epsilon_t$$

Note: The *INVefd* variable is expressed as a quotient between the variables *INV* and *EFD*, the *INVefd2* variable is expressed as the square of the quotient between the variables *INV* and *EFD*.

ECONOMETRIC ANALYSIS

On the basis of results, which are derived from econometric analysis, we can choose the best specification of aggregate production function. We started this analysis with a test of normality assumption. The purpose of the test was to find out if we could continue using the classical statistics (t, F, χ^2) in our econometric analyses. In order to test the hypothesis about distribution of residuals the Jarque-Bera test was used.

Next we checked three assumptions of the classical linear regression model: the lack of autocorrelation, homoscedasticity and the lack of multicollinearity between the explanatory variables included in the regression equation. The test of the autocorrelation was made with the Breusch-Godfrey test. The required homoscedasticity of variance was researched with the White-test and the multicollinearity was analysed by the calculated value of the variance-inflation factor (VIF). The econometric analysis was concluded by testing the fulfilment of two empirical criteria: goodness of fit of the estimated functions (F-test) and test of structural stability of the estimated functions. For analysing structural stability we used the Chow breakpoint test. We focused on the analysis of the p-value. The high p-value in individual types of the test suggests that we cannot reject zero hypotheses at an acceptable level of significance.

Table 1: Results of econometric estimations and tests

	Power Function	Cobb-Douglas Function	CES Function
Parameter estimates			
$\ln(b_1)$	2.661	0.047	4.146
	(1.999)	(2.244)	(1.734)
	[0.054]	[0.031]	[0.092]
b_2	0.149	0.134	0.345
	(13.677)	(17.181)	(1.622)
	[0.000]	[0.000]	[0.114]
b_3	0.662	...	0.448
	(6.325)		(1.387)
	[0.000]		[0.175]
b_4	...	...	0.011
			(0.750)
			[0.459]
Jarque-Bera test			
LB	1.469	0.616	1.254
	[0.450]	[0.735]	[0.534]
Breusch-Godfrey test			
LM(1)	0.447	0.939	0.114
	(3.841)*	(3.841)*	(3.841)*
LM(2)	0.804	1.150	0.514
	(5.997)*	(5.997)*	(5.997)*
LM(4)	1.199	1.585	1.212
	(9.488)*	(9.488)*	(9.448)*
LM(6)	1.867	2.516	2.098
	(12.592)*	(12.592)*	(12.592)*

RESULTS

On the basis of the results represented in table 1 we can make the following conclusions:

1. For the universal specification of power function and the Cobb-Douglas aggregate production function the estimated parameters are statistically significant. In the case of the CES function the fourth parameter is not statistically significant.
2. On the basis of the Jarque-Bera test statistics we can conclude that the residuals of the estimated equations are normally distributed.
3. In the regression equation the serial correlation is not present.

Table 1 (continued): Results of econometric estimations and tests

	Power Function	Cobb-Douglas Function	CES Function
White test of homoscedasticity			
$n \cdot R^2$	5.545 (11.071)*	3.417 (5.991)*	7,148 (15.507)*
Multicollinearity			
$VIF_{\ln(EFD):\ln(EFD)}$	2.512	...	2.512
$VIF_{\ln(EFD):\ln(INVefd2)}$	...	...	50.253
$EFD_{\ln(EFD):\ln(INVefd2)}$	...	...	1.881
F-*test of adjusted* R^2			
R^2_{adj}	0.962 [0.000]	0.879 [0.000]	0.964 [0.000]
Chow test of structural stability			
$p \leq 0.01$	0	0	0
$0.01 < p \leq 0.05$	0	0	0
$0.05 < p \leq 0.10$	0	0	1
$0.10 < p$	29	29	28

Note: the calculated test statistics are mentioned in round brackets. In squared brackets the exact level of significance (p value) is mentioned. Symbol * denotes the critical value of test statistic at the 0.05 level of significance. Source: own calculations.

Therefore, the error term of the regression models does not contain any systematic component. We may expect that the established definitions of the explanatory variables and the choice of statistical data for their measurements are correct.

4. On the basis of the White test we can conclude that there is no heteroscedasticity.
5. Between the variables *INV* and *INVefd2* included in the CES specification of production function there exists a high rate of multicollinearity. Therefore we can explain why the fourth regression coefficient in this function is not statistically significant at an acceptable level of significance. The statement suggests that the CES function does not differ from the Cobb-Douglas function.
6. The values of the determination coefficients show the good analytical power of the specified functions.
7. On the basis of the results obtained from the structural stability test

Table 2: Results of econometric analysis

	Power Function	Cobb-Douglas Function	CES Function
Overall significance of estimated equations	+	+	+
Significance of partial regression coefficients	+	+	–
Structural stability	+	+	+
Linear homogenity restrictions	...	–	...

Note: the symbol + signifies, that the restrictions are fulfilled, and the symbol – that they are not. Source: own calculations.

> we may conclude that all estimated aggregate productions functions are structurally stable. The behaviour pattern of the economic subjects did not change. Irrespective of whatever period we might have chosen in our empirical test we would have found that differences might not be statistically significant.

With regard to these criteria we could not carry out a grounded selection between the potentional and Cobb-Douglas specification (for this reason the elimination of the CES function is justified), therefore, we decided to make another test on the characteristics of returns to scale.[6] The results show that inclusions of a priori expectations of constant returns scale, which are inherent to the Cobb-Douglas specification, are not justifiable.

Inferences About the Nature of Economic Growth

The described parameters represent objective criteria for the choice of the most suitable production function, from which we can derive the explanation and the characteristics of the production process in the observed period. The statistically insignificant parameters in the CES function and also the insignificant constant returns to scale in the Cobb-Douglas specification suggest the power function as a suitable production function.

If we were doing further research, on the ground of the hypothesis that we may describe the characteristics of production process with the selected production function, we would have to quantify the growth rates of individual series, which were included in the production function. Here we use the trend growth rates received as a result of econometric estimation of the exponent trend.

The selected results are mentioned in table 3.

Table 3: Data used for developing the growth accounting equation

Trend Growth Rate	$r_{BDP} = 0.010486$	$r_{INV} = 0.039399$	$r_{EFD} = 0.004576$
Partial Elasticity		$\epsilon_{BDP,INV} = 0.149133$	$\epsilon_{BDP,EFD} = 0.661527$

Note: r_{BDP} – trend growth rate of quarterly real gross domestic product (constant prices 1995), r_{INV} – trend growth rate payments for investments (constant prices 1995), r_{EFD} – trend growth rate of effective labour, $\epsilon_{BDP,INV}$ and $\epsilon_{BDP,EFD}$ – coefficient of partial elasticity. Source: own calculations.

Table 4: Contributions of production factors to economic growth

Contribution of physical capital	$\approx 56.04\%$
Contribution of human capital	$\approx 28.87\%$
Contribution of total factor productivity	$\approx 15.09\%$

Source: own calculations.

From the data in the table we can estimate the growth rate of total factor productivity:

$$r_{BDP} = r_A + \epsilon_{BDP,INV} \cdot r_{INV} + \epsilon_{BDP,EFD} \cdot r_{EFD}$$
$$r_A = r_{BDP} - \epsilon_{BDP,INV} \cdot r_{INV} - \epsilon_{BDP,EFD} \cdot r_{EFD}$$
$$r_A = 0.010486 - 0.005876 - 0.003027$$
$$r_A = 0.001583$$

From this we receive all known parameters for writing down the final growth accounting equation:

$$r_{BDP} = r_A + \epsilon_{BDP,INV} \cdot r_{INV} + \epsilon_{BDP,EFD} \cdot r_{EFD}$$
$$0.010486 = 0.001583 + 0.005876 + 0.003027$$

If we want to find out the share part of growth of individual production factors in the explanation of 1,048 percentage of the trend growth rate of gross domestic product, we have to divide the last equation with this growth rate:

$$\frac{0.010486}{0.010486} = \frac{0.001583}{0.010486} + \frac{0.005876}{0.010486} + \frac{0.003027}{0.010486}$$
$$1 = 0.150963 + 0.560366 + 0.288671$$

Conclusion

In this article we presented the results abote empirical analysis of the nature of economic growth of Slovenian economy during the transition period 1992–2001. We were especially interested in finding out how succesful was this economy in using available resources. On the basis of four

groups of different arguments we were expecting that there would be a predominantly extensive economic growth. We tested this hypothesis using empirical analysis. In the first step we estimated three mathematical specifications of aggregate production functions. In the second step we made an econometric analysis of these estimates. Using these results we selected the power function and developed the growth accounting equation, which allowed us to compute the contributions of each particular input (physical capital, human capital and technical progress) to output growth.

From the received results it follows that the sixty-five percent of trend growth rate of the real gross domestic product can be explained by the growth of physical capital, by the growth of human capital twenty-nine percent and by the growth of total factor productivity of fifteen percent of growth of the Slovenian gross domestic product.

We can conclude that the past economic growth of the Slovenian economy during the period 1992–2001 was predominantly extensive.

Notes

1. Some aspects of transition in Slovenia are well documented in Bekő (2002) and Žižmond (1994, 1996).
2. We developed our analytical framework on the basis of the following references: Brown 1957, Uzawa 1962, Fisher 1971, Senjur 1993, Thomas 1993, Humphrey 1997, Stiroh 1998, Valdés 1999, Guarda 2000, and Mrkaić 2001.
3. CES = Constant Elasticity of Substitution.
4. CES production function means according to the preliminary one of Cobb-Douglas, which is actually her generalization (Thomas 1993, 304).
5. Analytically the calculation of series effective labour is shown in Novak 2003.
6. This test is not separately mentioned in this paper. The testing procedure and received results are presented in Novak 2003.

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The Yokes of Gender and Class: The Policy Reforms and Implications for Equitable Access to Education in Kenya

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Kenya, a former British colony, attained its political independence in 1963. Despite its political independence, Kenya inherited a colonial education system that was based on segregation and exclusion because of race, culture, class, and gender. This is a qualitative analysis examining the education system in Kenya. In the analysis, we explore gender and class barriers that may inhibit education for women in Kenya. We review existing secondary literature on policy documents; reflect on our experiences and observations; and also reflect on interviews with Njeri and Nyokavi, who live in the 21st century 'post-colonial' Kenya. As Kenyan women from subsistence-farming backgrounds, we, the authors, seemed destined to remain at the very bottom of the hierarchical education structure established during the colonial period. We explore the impact of contemporary, globally and locally mandated education policy reforms and emerging social service provision partnerships. These are often packaged as policy reforms and viable strategies of a just, equitable, and fair distribution of opportunities for all, meant to correct the colonial disparities. Our arguments are informed by the system's discursive framework (Wane 2000b) and the anti-colonial discursive framework (Amadiume 1989, 1997; Dei 1999, 2000; Oyewumi 1997; Wane 2002). The analysis authenticates that, since independence, Kenya has realized tremendous educational growth at all levels. However, such educational reforms have resulted in the exclusion of many children who are from low socio-economic groups, in essence replacing the racial segregation of the colonial system with cultural and class-based inequities of the post-colonial society.

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Introduction

The colonial legacy of segregation and inequitable distribution of resources and the unprecedented pace of global change, characterized by, among other things, the continual relocation and displacement of populations, have created significant socio-economic inequities in Kenyan society. The rapid population and political transformation has, in turn, resulted in the pressing need for related structures, including educational systems and organizations, to reflect and respond to the growing diversity and inequity (Iseke-Barnes and Wane 2000).

Drawing from the shifting socio-economic and political scenario, this paper examines some of the policy reforms, through both documentary sources and our experiences. We discuss how such reforms, on the one hand, have influenced educational growth but have also contributed to the marginalization of children from low-income groups, the girls in particular. Using systems and anti-colonial discursive frameworks, we analyze multiple equity issues arising from various cultural and class dynamics and their implications for access to education. Further, systems discourse enables us to explore interconnections between schools, students, and society (Wane 2000b). In addition, we are able to examine the relationships between class, gender, and culture. An anti-colonial discursive approach, on the other hand, affirms the pedagogic need to confront the challenge of social diversity and the urgency of creating an educational system that is both more inclusive and better able to respond to the varied local concerns about formal schooling (Dei 2000). This is a qualitative analysis examining the education system in Kenya. In the analysis, we explore gender and class barriers that may inhibit education for women in Kenya. We review existing secondary literature on policy documents, and, using vignettes, we reflect on our experiences and observations and also reflect on interviews with Njeri and Nyokavi, who live in the 21st century 'post-colonial' Kenya. The paper is based on work in progress on comparative policy analyses of Kenya, India, and Canada, which attempts to interrogate how equity could be created through schooling (Reva, Wane, and Gathenya, Creating equity through schooling: A cross-national study of Kenya, India and Canada). Our discussion is grounded in the global educational goal of Education for All (EFA) (UNESCO 2000), in the context of the current figures for children who have not attained formal schooling.

This analysis builds on the work of scholars such as George Dei

(1999; 2000), Annette Henry (1998), Linda Smith, Gloria Ladson-Billings (1994), Vivian Gunn Morris and Curtis L. Morris and Angela Valenzuela (2000), to name just a few, who are questioning the inadequacy of social, educational, and political practices that do not speak to the variety of human experiences or to the diverse history of events and ideas that have shaped human growth and development. Examining educators', administrators', and learners' locations, the politics of meaning in education, and issues of bias in education can highlight the problems associated with institutions of learning as sites for the reproduction of social inequalities (Wane 2000b). The theoretical and practical underpinnings of cultural studies, critical pedagogy, feminist studies, anti-racism education, and Aboriginal education are important avenues that assist in the interrogation of power inequalities and bias in educational settings and society (Wane 2000b). Employing critical educational pedagogies and social theories makes it possible to articulate a pedagogic discourse to understand the political organization and relationship of school and society. Assumptions of what constitutes the norm, what qualifies as valid knowledge, and what alternatives to the dominant discourses exist are some of the pedagogical challenges to be confronted (Wane 2000a).

As educators, we must counter the negative effects of oppression and address areas where critical work is needed. We acknowledge that this is not an easy task but rather one that will require a great deal of sensitivity and knowledge to address the intersecting issues of equity in our classrooms. As Waterfall (2000) eloquently puts it, 'To do so effectively requires that our praxis be informed by a solid framework. Without such a framework our good intentions can end up reinforcing and exacerbating the reality of inequity in [education]' (Waterfall 2000, xviii). In order to illustrate the issue more clearly, we will employ vignettes to reflect on the complexity of the educational experiences of girls in Kenya.

Njeri, an Eight-Year-Old Kenya Girl, Beats the Odds

It is six o'clock in the morning. Njeri is walking briskly to school. She has two miles to get to her destination. This morning she cannot sing her recently learned hymn, nor can she chase the butterflies or pick some flowers. She is saying her times tables: $12 \times 1 = 12$, $12 \times 2 = 24$, $12 \times 3 = 36$, $12 \times 4 = 48$, $12 \times 5 = \ldots$. Oh! She cannot remember. She examines her arms and legs where she had written her times tables, to see whether the numbers are still visible. But, alas, she forgot to preserve those spots when washing her arms and legs this morning. The alternative is to re-

cite them before the teacher, so she tries again, starting from the very beginning: 12 × 1 = 12 .... This time, she remembers up to 12 x 8, but she cannot remember 12 × 9. She tries once again, and, this time, she is determined to get it right. She does not want to go to school on Saturday as a punishment. What upsets her is knowing that the teacher will force her, and those of her classmates who cannot recite their 'homework', to bring firewood and water from home. That is a long distance to carry firewood or water. She feels that this is not a fair punishment and on a Saturday.... That is the only full day to play with her friends or to help her mother. Sunday is too short because she has to attend Sunday school and learn all the Bible verses. She wonders how much adults have in their brains if they have to memorize everything. However, she pauses to enjoy the rays of the sun and the silver beads formed by the morning dew. She wishes these beads were real, because she would have loved to make a necklace for her teacher. Well, maybe one day she will make a coloured beaded necklace for her. She has been observing her grandmother make necklaces and following her instructions on how to thread together these tiny beads.

She goes back to her times tables, but her thoughts run away again. She is thinking of her sister Nyokavi, who has been out of school for the last two years. Her parents wanted her to go on, but something happened, she is not sure what, something to do with not passing her exams and being sent to a secondary school that requires a lot of money; her father referred to it as an *Harambee* (let us pull together) school. But she needs to get this times table: 12 × 10 = 120 .... Once again, she is distracted. She enjoys school but sometimes her teacher does not ask her to answer questions even if she raises her hand. She hears the sound of the bell and starts to run as she completes her times table: 12 × 1 = ...

Drawing from this vignette of Njeri's educational experience, we will now begin to examine the diverse forces at play in Kenya's system of education. Although Njeri is only a young girl, probably eight or nine years old , she yearns for an education, but even at this young age, she is quite skeptical regarding her future opportunities.

OUR EXPERIENCES AND OBSERVATIONS

As we reflect on the above scenario, Njeri's experiences resonate with us, and we ask ourselves, How many Njeris are going through similar challenges? We faced similar challenges when attending school in the 1960s and 1970s and believe we were able to excel in school not by being the

smartest in class but by overcoming cultural, economic, and daily learning challenges that defeated our less determined, and perhaps less lucky, peers. There were few or no writing facilities to record what we learned. Hence, we had to commit to memory all the new knowledge that we were learning in school. To learn and remember the relevant mathematical times tables and the alphabet, for instance, we recited them over and over while walking to school or to the river to fetch water, while tilling the land or minding the young ones or searching for firewood. Many times we had to write on our hands or legs to help us remember anything new that we had learned. The standardized examinations were organized in such a way that one was expected to remember what was taught right from standard (grade) one to standard seven (now eight). What made it even more challenging was that most of the materials we were expected to learn (memorize) were foreign and reflected little of the world in which we lived. Our daily chores, in particular, often required us to seek the skills elsewhere, as school did not prepare us for these essential tasks. We experienced contradictions and confusion. The knowledge we acquired in school had no relevance at all to our home life. And the more we learned about other countries and foreign languages, the more we became alienated from our roots (Wa Thiongo 1985).

This created a sense of dissonance and confusion, as most of what we learned in school emphasized how primitive, backward, and evil our traditional knowledges were. Our indigenous languages (mother tongues) and traditional beliefs were discounted – such 'primitive' practices were never allowed within our school compounds. At school, the sole medium of communication was English. Later, Kiswahili and religion were offered in some schools, depending on the religious denomination of the school – Catholic, Anglican, Presbyterian, Muslim, Hindu, etc. This rigid enforcement of language practices caused further complications for us, since we could not communicate with our parents in English at home, as they did not speak the language. Consequently, at home we had to switch back to our mother tongue. The situation became difficult when we attempted to discuss issues such as the biological functions of human bodies, which we were learning about in school. According to our tradition, this was taboo. When we tried to question such practices as circumcision for girls, for example, we were alienated. This was because circumcision was a particularly thorny issue around which there was no consensus in the community. Often girls were withdrawn from school to be circumcised and were then barred from going back to school. Al-

though others chose to run away from home to escape the ritual, remaining uncircumcised often resulted in the girl being ostracized by peers, family, and the community. Growing up as girls and attending school in the post-political independence era, we were among the few who broke many traditional norms both at school and home.

Our respective parents were unusual, as they encouraged us to pursue education when it was not the norm. Many girls were married off as soon as they reached puberty. It was also rare to see parents sell their land to put girls through school or for the community to come together in the spirit of *Harambee* to raise funds to educate a girl. The expectation was that girls should bring in more property in the form of a dowry (cows and goats), not deplete the family wealth by attending school. Today, we find ourselves in North American institutions of higher learning, participating in the education not only of Kenyan children but also of children of the world. It may appear, at one level, as if we have relinquished our traditions and our cultural roots and embraced all that is Western. On the contrary – education has provided us with choices as well as challenges. We are able to examine our culture from a different perspective, choosing to embrace and retain only those values which have significance for us.

In order to explicate some of the dilemmas, we will briefly examine the systems discourse and anti-colonial thought to see how the two discursive frameworks speak to the system of education in Kenya since the attainment of political education.

A SYSTEMS DISCOURSE

A systems discourse is a discursive framework that illustrates the functioning and relationships of sub-systems within the larger society, illustrating systematic power imbalances, as well as methodical barriers that are embedded within the various sub-systems of the larger society. This discourse enables us to examine the ways in which social institutions both create and sustain interconnectedness and interdependency. Using this framework, we are able to explore more fully the dilemmas, tensions, and fears that educational institutions may experience as a result of their multiple roles within given systems (Wane 2000b). In order to examine the Kenyan educational system, we believe that it is necessary to re-examine the wider socio-economic and political context and, in particular, the colonial and neo-colonial education structures that con-

tinue to shape access to Kenyan education and quality patterns to the present day.

Anti-Colonial Discursive Framework

Anti-colonial discourse is rooted in 'recent movements for social change' that question concepts of 'normative' and/or 'universal' standards by recognizing that such concepts are limited and limit the perspectives of a particular gender, class, and/or race (Amadiume 1989, 1997; Collins 1990; Dei 1999; Hooks 1994; Oyewumi 1997; Wane 2002). In this way, anti-colonialism is a social theory that interrogates power relations inherent in the interrelations between subordinate, colonized groups/societies and dominant, colonialist societies or cultures. Anti-colonial thought entails writing and speaking about the experiences of slavery, migration, suppression colonialism, neo-colonialism, and resistance (Dei 2000; Ashcroft 1995). The overall aim of an anti-colonial framework is to provide the critical tools for deconstruction of representations of neo-colonial structures (Dei 1999; Mudimbe and Appiah 1995). For instance, the academic imperial structures currently control and shape the destiny of African education development in general and education in Kenya in particular (Eshiwani 1990). The aforementioned critical tools may provide a forum for theorizing some key challenges that have kept many Kenyan children from the doors of formal schooling.

Interrogating various configurations of power relations embedded in knowledge production and currency is also a key component of anti-colonialism. The approach acknowledges the dual, and at times conflicting, roles of education in (re)producing and/or counteracting racial, ethnic, religious, linguistic, gender, sexual, and class-based inequalities in society. Further, anti-colonial discourse problematizes the marginalization of certain voices and ideas in the educational system. It also critiques the pedagogic and communicative practices of schools and the delegitimation of the knowledge and experiences of subordinate groups. It is a framework within which schools are viewed as institutional structures, sanctioned by society and the state to serve particular material, political, and ideological interests. In this context, marginalized groups are treated as subjects of their own experiences and histories (Dei 2000). Critical educators argue that questions of difference (class, gender, sexuality, race, ethnicity, disability, religion, etc.) are consequential for schooling in today's contexts (see. e. g., Dei 2000).

In order to contextualize these issues, we will now provide a brief historical overview of the Kenyan context, including the land, its people, and relevant socio-economic and political environments.

Kenya at Independence and Beyond

'Everyone has the right to education,' states the Universal Declaration of Human Rights, adopted in 1948 (Republic of Kenya 1964/5, 1988, 1999). Even earlier, in 1963, the Kenyan government made a political commitment to Kenyans that education would be accessible to all, regardless of religion, ethnic background, gender, geographical location, race, and/or class (Republic of Kenya 1964/5, 1988). Yet reports such as Oxfam International (2001), and UNESCO (2000), showed that in the years 2000 and 2001, respectively, more than 113 million children had no access to primary education, in addition to 880 million illiterate adults. By the late 1990s, between 11% and 20% of the school-age population were out of school (Abagi 2000). In some regions, close to 80% of eligible children were out of school (Republic of Kenya 1998). Regional, gender, racial, and other socio-economic factors continue to permeate education systems, resulting in inequitable access to quality education. Consequently, in many parts of the world, the quality of learning and the acquisition of human values and skills fall far short of the aspirations and needs of individuals and respective societies. The *Education for All* (UNESCO 2000) assessment demonstrates that there has been significant progress in the educational development of many countries, including Kenya. However, the developing world is still too far away from achieving the EFA goal and, like many others, may not do so by the newly set date of 2015.

Despite these vast disparities across countries, education is internationally recognized as a fundamental human right (UNESCO 2000). Education has been identified as the key to sustainable development, peace, and stability within and among countries and thus is an indispensable means for effective participation in the societies and economies of the 21st century, which are affected by rapid globalization. Given the still extensive need for improvements, the timeline for achieving EFA goals has been shifted from year 2000 to year 2015 (UNESCO 2000). We must question, however, the implications that these postponements will have for individual and societal development. When children are denied basic education, their ability to support themselves as adults and to provide for their basic needs and the needs of their families is compromised. For instance, the *Education for All* (UNESCO 2000) assessment for Sub-

Sahara Africa indicates that, despite notable gains by various countries to expand education opportunities, nearly a half of these disadvantaged groups are in the region. It is estimated that in this region alone more than 41 million school-age children, 56% of them girls, are out of school (Abagi 2000).

Njeri's scenario reflects the reality of what is happening in the education sector in Kenya (a Sub-Saharan African country) despite the noble goals of the EFA. The expansion of educational opportunities has been a longstanding objective of the government since independence in 1963, as stakeholders continue to perceive formal education as a basic tool for individual and national progress. This belief is supported by research that has established the connection between formal education and socio-economic and political benefits (see, e. g., Abagi 2000). When formal education opportunities are available to girls and women, the benefits are even greater. This wisdom is enshrined in a local Kenyan saying: *Wathomithia muiretu, ni wathomitha mbururi.* ('When you educate a girl, you educate a whole nation.') Hence, the issue is not that people need to be convinced of the need to educate girls – rather, it is why, despite this acknowledgement, girls continue to be marginalized in terms of access to quality education. On the positive side, at the primary school level, girls' and boys' enrolments are almost at par. This is a significant achievement, given the large gender gaps in enrolments at the time of independence. At the post-primary levels, however, the strategies to improve girls' enrolment and retention figures have not had as much impact as at the primary school level. This disparity may be attributed to the persistent belief system that posits girls as investments. In other words, girls are seen as temporary members of the family who will eventually move out as wives for the benefit of their new families. Consequently, girls' value to the family is associated with the dowry that they can expect to bring to the family when married. Within this socio-cultural environment, the cost of educating girls is not considered a wise investment. Hence, the less spent on the girl the better.

Trends in the Education System Since 1963

The economic situation in Kenya has had a significant impact on the educational system. Within the last two decades, the living conditions of the vast majority of Kenyans have stagnated or worsened, while those of the few at the top have improved beyond anyone's dreams, thus further widening the gap between the extremely rich few and the extremely poor

majority. This adverse socio-economic growth is reflected in the outcomes of the education system, where an increasing number of children do not attend school because many of them cannot afford to (see, e. g., Gathenya 2001, 2002; Oxfam International, 2001; Wane and Gathenya, 2001), and many school-leavers are unemployed (2002). In our discussions as authors, we often asked ourselves, What went wrong? What happened to an education system whose growth was exemplary in the East and Central African regions up to the mid-1980s? To analyze how education services intertwined with the socio-economic and political set-up in shaping contemporary trends, we provide an overview of Kenya's education system since 1963.

The vision and national goals of education are expressed in the *Kenya Education Commission Report* of 1964 (a. k. a. Ominde Report, Republic of Kenya 1964/5), which provided a framework for operating a unified education system in independent Kenya. The new nation inherited a colonial education that was described as a 'caste' system with rigid boundaries for different communities, which meant that there were separate schools for Europeans, Asians (and Arabs), and Africans, in that order of priority. Within this racially segregated system, 99% of the public education budget was spent on European and Asian schools, while 1% was allocated for the African schools (Republic of Kenya 1964), in a country with a population that was predominantly African. Besides funding hierarchies, the education and training curricula were designed on these racial classifications within a philosophy of 'education for one's station in life'. The African was educated/trained for manual labour and religious discipleship, the Asian for middle-level technical labour, and the European for management and governorship of his/her colonial territory. It is no wonder, then, that at independence universal education access, equity, funding partnerships, standardization, and improvement of curriculum became key issues for policy planners and practitioners. The findings of the Ominde Commission (Republic of Kenya 1964/5) captured these issues and made recommendations that resulted in rapid expansion within a single national education system. But the inequities in access, quality, and relevance still exist despite many reforms designed to improve the provision of education for all.

Since 1965, there have been subsequent education commissions (e. g., Republic of Kenya 1976, 1988, and 1999a, respectively, a. k. a. Gachathi, Mackay, Kamunge, and Koech Reports) that re-emphasize the six goals of education laid down in the 1964/5 Ominde Report and articulated in

the 1999 *Kenya Country Report* (Republic of Kenya 1999b). These national educational goals are (1) to foster national unity; (2) to serve the needs of national development; (3) to promote social justice and morality, social obligations and responsibilities; (4) to foster positive attitudes and consciousness towards other nations; (5) to provide for full development of talents and personality; and (6) to provide and equip the youth with knowledge, skills, and expertise to enable them to play an effective role in the life of the nation. We will now explore whether these goals have been attained, and if not, why not.

Following recommendations by the above Commissions and other research/evaluation surveys (e. g., Republic of Kenya, 1995, 1998; Republic of Kenya and UNICEF 1995), the Kenyan government has planned and implemented numerous structural and program reforms in attempts to meet these educational goals and to address identified challenges. The current 8 : 4 : 4 system of education (eight years of primary education, four years of secondary education, and four years for a basic bachelor degree) is one such systemic reform implemented since 1985. It re-shaped the previous system of 7 : 4 : 2 : 3, modeled on the British system, that involved seven years of primary education, four years of ordinary level secondary education, two years of advanced level secondary education for a small percentage, and three years of university education. Promotion between levels is based on merit, as measured by academic performance in national standardized terminal examinations.

MAJOR EDUCATIONAL REFORM: THE 8 : 4 : 4 EDUCATION SYSTEM

Until the end of 1984, at which time major reforms were implemented, formal education in Kenya was based on a 7 : 4 : 2 : 3 system of education cycle. The concept of the 8 : 4 : 4 system of education was developed to respond to the challenges of national development with the youth as active participants. Besides the structural reforms, the 8 : 4 : 4 system of education was planned with a more vocational orientation (Republic of Kenya 1988). The systemic reform that resulted in the shift to the new model emanated from the Mackay Report. The broad-based changes to the educational system were introduced as a means of responding to the challenges of national development. The Mackay Report formed the framework for the revamped system, although the report did not contain details of when or how the new education system could be implemented. The most important changes that were introduced involved the reor-

Table 1: Gross enrolment rates in primary school by gender, 1990–1998

	1990	1991	1992	1993	1994	1995	1996	1997	1998
MF	101.8	91.4	91.0	87.8	88.5	86.8	86.4	87.7	88.8
M	104.0	93.4	92.0	88.9	89.1	87.4	87.3	88.7	89.4
F	99.6	89.5	90.0	86.7	87.8	86.4	85.5	86.8	88.2

Source: UNESCO 1999; Republic of Kenya 1994.

Table 2: Primary school completion rates by gender, 1990–1998

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Boys	45.7	46.4	44.7	44.5	44.6	43.0	45.1	46.3	44.6
Girls	40.5	41.6	48.2	42.2	43.0	42.1	43.5	45.8	48.1
Total	43.2	44.1	46.4	43.4	43.9	42.6	44.3	46.1	47.2

Source: UNESCO 1999; Republic of Kenya 1994.

ganizing of the system to an 8 : 4 : 4 structure, the creation of a second university, and an enhanced vocational program. Despite the country's budgetary constraints and local and international education and training policy implications, soon after the Mackay Report was released, the government made a political announcement launching both the second university and the proposed 8 : 4 : 4 restructuring. Issues of policies, cost, inequity, relevance, efficiency, and effectiveness of the system were questioned and reviewed (Abagi and Olweya 1999, 2000; Republic of Kenya, 1995, 1998; Republic of Kenya and UNICEF 1995). It soon became apparent to most Kenyans that, although the goals of education are 'well' articulated, they have not been realized or translated into meaningful sustainable and quality programs accessible to all (see, e. g., Republic of Kenya 1998; Republic of Kenya and UNICEF 1995). Granted, many Kenyans, in particular Africans and women, have benefited from the reforms that have focused on access, equity, quality, and relevance. However, the system has been inefficient and ineffective on many fronts, despite the heavy investment in education within a framework of innovative funding partnerships and shared management responsibilities. Waste through low enrolment, participation, and retention rates, coupled with high repetition and dropout rates, has been identified as a key indicator of the system's inefficiency by the government (Republic of Kenya 1998, 1999a). Primary and secondary school gross enrolment rates, for example, have been on the decline from 1990, as indicated in Tables 1, 2, and 3.

Table 3: Percentage distribution of secondary school enrolment by gender in selected years, 1963–1998

	1963	1965	1970	1975	1980	1985	1990	1995	1998
Male	68.2	72.4	70.4	64.1	59.3	61.8	57.2	54.1	53.3
Female	31.8	27.6	29.6	35.9	40.7	38.2	42.8	45.9	46.7

Source: UNESCO 1999; Republic of Kenya 1994.

As noted in Table 1, at the primary school level, the gross enrolment rate (GER) in 1990 was 104.0 for boys and 99.6 for girls. The average for both girls and boys was 101.8. There was a sharp decline in 1991 and 1993. In 1995 and 1996, it was 86.8 and 86.4, respectively. In 1998 and 1999, there was some improvement in GER. In 1997, GER was 86.6 for girls, 88.7 for boys, and an average of 87.7. In 1998, the figures were 88.2 for girls, 89.4 for boys, and 88.8 for both. Besides, primary school completion rates were consistently below the half – 50% mark. In 1995, it was 43% for boys and 43.5% for girls, with an average of 44.3%. In 1998, it was 46.4% for boys, 48.1% for girls, with an average of 47.2% for both boys and girls (Table 2). Boys' enrolment in secondary school has remained higher than that for girls over the years, as shown in Table 3, an indication of how girls in Kenya continue to remain at the bottom of the education ladder.

Further still, the implementation of the 8 : 4 : 4 system introduced new pressures to the educational system, and the ramifications are still being felt. For instance, in 1990, after four years of secondary education, a double cohort entered university (the Form VI or 'A' level group). It is generally believed that the public universities have not yet recovered from the administrative, space, class size, and curriculum challenges of the double intake, as enrolments never dropped to their previous levels thereafter. The demand remained high, leading to the entry of the private universities (from zero to sixteen) into Kenya's higher education market and the expansion of public universities from one to five universities. The 8 : 4 : 4 curriculum was supposed to be more practically oriented, to curb the high unemployment rate generated by the high population growth rate in Kenya, by offering a wide range of employment opportunities to the school-leavers. The aim was to vocationalize education through a curriculum that provided relevant technical and vocational skills at the three levels of the schooling system for improved self-employment, salaried employment, and/or life-long education and training. Within the 8 : 4 : 4 system, Standard 8 school-leavers would have opportunities for further

technical training, without necessarily going through the formal post-primary school system. This would be in line with the government development strategy of creating jobs and generating income by expanding the informal sector. However, policy planners did not anticipate the large number of students who would continue in the system.

SIGNIFICANT ISSUES WITHIN KENYA'S CONTEMPORARY EDUCATION SYSTEM

Drawing on Njeri's educational experience as a point of reference, the following will analyze the pertinent issues within Kenya's contemporary education system.

Primary Education

Primary education is the most 'general' of all kinds of formal education and is supposed to provide the foundation for further learning and for the long-term strategy of eliminating illiteracy. The basic goal of primary education is to prepare all children who attend school to participate fully in the social, economic, and political life of the nation. This stage of education is supposed to be universal and free but not compulsory. The curriculum is uniform throughout the country and is developed by a national panel at the Kenya Institute of Education. Until 2001, all students were expected to take all eleven subjects, namely: Kiswahili, English, Mathematics, Science and Agriculture, Home Science, Arts and Craft, Music, History and Civics, Geography, Religious Education, and Physical Education. At the end of Standard 8, students would be examined in eight papers that incorporated all eleven subjects. At the time of writing this paper, we learned that this curriculum had been reviewed, resulting in fewer subject areas for study and examination. Once again, it is a frantic time as education policy-makers and practitioners adjust to the latest reforms, including the preparation of a new curriculum and new teaching and learning materials – and the training of teachers to implement the changes.

The government aim and stated commitment is to provide education to all Kenyans; yet approximately 30% of the primary school-age children have no access to formal school education. This is because of lack of equitable distribution of the educational resources. In addition, the system is structured in such a way that only some (fewer than 50%) of those who complete primary education make it to the secondary level,

and even fewer (approximately 20% of those who complete secondary schooling) have access to further education and/or training.

Secondary Education

Kenya's secondary education is organized around fully funded public/government schools, community or religious funded schools, and private, unaided schools. Parents and community members, through self-help *Harambee* efforts, built most of the public and community schools. Private schools are individually run and owned and are usually very expensive and beyond the reach of most Kenyans. Since 1991, all schools have been categorized as either public or private, based on respective funding and management model options (Republic of Kenya 1998). In policy, the categorization made sense administratively but not practically. Ideally, this categorization should have been ratified through a revised Education Act soon after the 1991 policy statement. To date, there are still grey areas, as indicated by the fact that, while some schools are labeled private, they are managed by religious organizations and therefore receive partial public and community assistance. Although these schools could be labeled public, thereby reducing the confusion, many private proprietors fear that with the public label comes loss of controlling power in terms of planning, management, and accountability.

Despite this innovative partnership in secondary education development, many children have no access to secondary education. In our vignette Nyokavi, Njeri's sister, has completed her primary education, missed a government secondary school, joined a *Harambee* one instead, and then dropped out. She has been out of school for the last two years. When Wane (one of the authors) interviewed her in 1998, she was tearful for most of the three-hour encounter. She kept repeating to herself:

> What can I do? Who can I turn to? I would like to buy my parents a bigger farm. They have sold everything to put my big sister, Wawira, through secondary school [Wawira completed four high school years] and pay for Nyokavi. It is sad that my parents could not afford to send Wawira to university. She was so desperate for higher education that would have meant a good job. Now she would like to come and live with us, but she feels she is better off on the streets of Nairobi. As for me, all I want is a secondary education.

Cost-sharing and other resource demands mean that most families cannot afford to send their children to either the public or the private secondary schools. Within this policy, parents are expected to pay tuition and development/building funds (e. g., for construction of classrooms, workshops, laboratories, dormitories, staff houses, and kitchen/dining halls), buy expensive uniforms and books, and contribute towards meeting their respective schools' recurrent expenditures, including salaries for non-teaching staff and the purchase of school buses. Alternately, faced with increased fiscal challenges, some schools have discovered unique and rewarding cost-cutting strategies, which include income-generating and other self-reliance activities such as making their own uniforms, growing their own food, keeping livestock for school use, and marketing and applying shared-text-book policies. Other schools have introduced Parents and Teachers Associations' bursaries and scholarship schemes to assist children from poor families and/or orphans. But such efforts are like a drop in the ocean because the need for such assistance in all cases exceeds demand.

University Education

For a country that had only one constituent university college at the time of independence (in 1963), Kenya's university education has expanded remarkably, not only in terms of the number of institutions and enrolments but also in the scope of the degree and other programs, both on-location and long-distance. For example, the student population grew from 452 undergraduates in 1963 to over 40,000 by 1999. This unprecedented growth is not without challenges. Following the structural and other systemic reforms of the mid-1980s, the double cohort intake of 1990, the cost of implementing the new curriculum, and putting up additional required physical facilities resulted in unparalleled costs to the government, individuals, and other stakeholders. The structural adjustments programs introduced in the 1990s that led to budget cuts in education and other services meant that the households had to bear most of the additional reform-driven costs.

Student unrest has become almost an annual certainty of the public universities' life, in part due to space, human resource, and other shortages. At least one or more of the five universities are closed each year due to student and/or staff strikes. While attending one of the universities, we (the authors) lost more than two years (each) due to extended closures. Students normally complain about congested and dilapidated learning

conditions, curriculum, tuition hikes, and/or political unrest in Kenya or elsewhere in the world. In the 1970s, commemoration of the Soweto Massacre (in South Africa) often triggered student demonstrations that would begin peacefully and end in battles between police and students, leading to closures.

With the entry of private universities into Kenya's education scenario, those families which can afford to do so send their children to these universities or overseas, chiefly to India, Britain, and the US. In comparison, fewer students are sent to Canada, Australia, and Germany. The community *Harambee* efforts have been instrumental in enabling some children from the lower middle-income groups to attend public, private, and/or overseas universities. The government has also introduced a loan and bursary scheme at the university level to assist those who pass but cannot afford to meet the required payments to join university. However, as in the secondary education programs, the need for assistance exceeds demand.

COMMENTS ON CURRICULUM

The Kenyan school curriculum has been broadly criticized, as both the curriculum and assessment are modeled on mainstream, high-income groups' experiences, thereby further marginalizing many children, especially those from remote rural areas and from the slums in the urban towns. There is enormous pressure to succeed in the examination and selection-based system, which encourages many students to resort to examination-oriented rote learning, often at the expense of more critical learning. It has even been suggested that the school curriculum contributes to violence in schools due to the overwhelming pressure borne by students to pass examinations in a curriculum that is so examination/selection-driven. The system is structured in such a way that schools strive to compete in national examinations, sometimes at the expense of the health of students, teachers, and/or parents. Slow learners are prevented from proceeding to the next class and/or taking the national examination, so as not to lower their respective schools' standards. Many repeat one or more classes several times, and some of them give up altogether and drop out of school.

Excelling in the educational system as it currently operates often requires extra tuition/coaching, special textbooks, and long hours of continuous study at school and home. Those who cannot afford the extras are unlikely to succeed. As we reflected on our educational experiences,

we concluded that it is no wonder that, in this context, the many Njeris, Nyokavis, or Wawiras never make it to college – not because they are not capable but because there are far too many systemic barriers that are beyond their control. The wonder is that any children from low-income groups, and particularly the girls, make it at all.

BARRIERS TO EDUCATION ACCESS AND QUALITY PARTICIPATION

Prior to Kenya's political independence, women's access to formal education was extremely limited, although we acknowledge that African men's access was hardly any better, given the British colonial policy that restricted Africans in general from acquiring a decent education. Specific data are difficult to trace, however, as earlier education commissions (pre-1985) rarely focused on women as a special target group in educational planning. As most statistical data were not recorded by gender, enrolment growth hid the disparities between boys' and girls' participation in education. A new chapter in gender and diversity awareness was launched in 1985, as the end of the first International Women's Decade was marked in Nairobi, Kenya. Affirmative action strategies were put in place to ensure that girls and children from marginalized regions were better represented at all levels of education, training, and employment.

There is evidence that, in some parts of Kenya, girls' enrolments increased at a faster rate than boys' enrolments during the affirmative action period (Republic of Kenya 1995; Republic of Kenya, 1998). At the primary school level, girls' enrolments are almost equal to boys' enrolments (49 girls : 50 boys), while in some districts within Eastern and Central Provinces, more girls than boys attend school. Regional differences are marked, however. In the nomadic arid and semi-arid regions, total enrolments are much lower than in the rest of the country, and girls' enrolments still lag far behind (Republic of Kenya 1998).

A number of significant factors contribute to the lower rate of academic achievement by girls, limiting their access to competitive fields: cultural, structural, and other social barriers; lack of job incentives; and lack of proper role modeling and counseling, among others (see, e. g., Abagi 2000; Republic of Kenya and UNICEF 1995). Cultural values and cultural demands on girls' time may also inhibit many from getting quality basic education. In Kenya, girls are socialized to believe that marriage comes first. Most girls in Kenya are married before the age of 21. By this age, only a few girls have been able to go through the formal edu-

cation ladder and training to become professionals, and there are very few women role models. As a result, few girls are exposed to opportunities and few aspire to higher education and training and top management jobs. Although the government has stepped up counseling services in all schools, the effect of this has not yet been seen, because the system provides few support systems for girls to proceed from one level to the next. Many are shut out because they become pregnant, and there are few occasions where students are taught about female–male relationships, chiefly due to cultural and/or religious taboos that restrict individuals who could be entrusted with disseminating such personal information. In this context, the school is among the chief suspects, with parents fearing hidden agendas and the passing of culturally unacceptable sexual information to their children.

Of those who go further in school, many opt for arts-based subjects, eschewing the sciences as overly masculine. Those girls who deviate from the norms by receiving higher education and/or entering male-type jobs are still seen as less likely to get married, or, if they do, as unlikely to make good wives and mothers. As a result of the aforementioned cultural beliefs, the majority of women choose academic paths, which limit their options later in life, often relegating them to a low status and low-paying jobs.

IMPACTS OF SYSTEMIC EDUCATIONAL REFORMS

The inherited colonial education posed many difficulties and challenges with respect to issues of access, quality, equity, relevance, and participation within new policy/program structures and the philosophical shift. Despite frequent evaluation and research into the system, recommended reforms have not met many objectives. Most frustrating is not the failure to provide education to all children but that positive trends have been reversed since the late 1980s, a period that coincides quite closely with the era of the global economic structural adjustment programs. Further, resources allocated to education are not always effectively or efficiently utilized, leading to the exclusion of low-income groups while subsidizing the public and private education accessible to children from middle- and upper-income families. For instance, communities have been known to collectively put up schools by *Harambee* efforts, only to find that some children in the same community are to be excluded from the same institutions because they cannot afford the policy-mandated fees and other levies within the cost-sharing service provision framework. Con-

sequently, some parents who helped to put up community schools soon discover they cannot afford to send their children to the same schools. Since only those who can pay the required amounts gain admission, the poor end up supporting the rich.

So while Kenya introduced cost-sharing (among the government, parents, and communities) in attempts to improve education access, quality, equity, and relevance, the outcomes have seen further marginalization of children from low socio-economic groups, including street, slum, and nomadic children, girls, and the disabled. As in the case of Njeri's family, passing the cost burden on to parents has had devastating impacts on some. Njeri's parents, having sold most of their land to send their children to school, were left almost landless, and yet none of the children had made it to the post-secondary level or found employment.

In retrospect, considering our similarly disadvantaged backgrounds, we recognize that, had our communities not come to our aid through *Harambee,* we too would not have made it past primary education. We argue that, while individuals have responsibilities to bring up their children, government has a responsibility and is accountable to all citizens, particularly since every Kenyan household is subject to one form of taxation or another. Provision of free, quality education so that no children will be denied access because of their inability to pay is a policy commitment (Republic of Kenya 1988, 1999a; UNESCO 2000). The gap involves translating that commitment into practice. The future cost of not educating any child far outweighs any current savings through budget cuts and the balancing of account books. Kenyan parents and communities are not abdicating their responsibilities; they have been supportive and contributed tirelessly to the growth in education and training. The onus is on the government and those in power to explore, perhaps more actively, alternative, innovative ways of mobilizing resources available to support education for all and to develop clearly defined strategies for achieving this goal. The question should not be who should or should not access education, but rather how we can provide quality education to all.

In recent years, there has been an alarming escalation in the number of children in Kenya who are homeless and/or who try to survive on the streets of large urban centres and rural towns (Bagayoko 1999; Gathenya 2002). Many of these children have parents living below the national poverty line or are orphaned victims of ethnic clashes and/or HIV/AIDS. A 1994 estimate put the number of street children in Nairobi at 50,000.

Table 4: Kenya's Human Development Index score, year 2003

Indicator	Year	Score
Life expectancy at birth	2001	46.4 years
Adult literacy (age 15 and above)	2001	83.3%
Combined primary, secondary and tertiary gross enrolment	2000/01	52%
GDP per capita	2001	$980
Life expectancy index	2001	0.36
Education index	2001	0.73
GDP index (HDI) value	2001	0.38
Human development index (HDI) value	2001	0.489
Overall ranking	2002	146

Source: United Nations Development Programme 2003.

Kenya's ranking on the Global Human Development Index (HDI) has dropped from 113 in 1991 to 125 in 1994 and further declined to 146 in 2003 (see Table 4). This implies that the overall human development status of Kenyan people is declining, not only in absolute terms but also in relation to other nations.

The population of poor people will most likely continue to rise, given the deteriorating economic climate, the loss of some donor agencies and NGO support, and the increased numbers of children being forced to leave school to support their families. The future economic and social development of Kenya is at risk unless the rights and needs of children for sufficient levels of health, education, and psycho-social growth and development are protected. Street children in Kenya range in age from the newborn to the young adult. Demographic data reveal that most street children had some education but that all had been forced to leave school early (that is, before completion of fourth grade) due largely to poverty, lack of support, and the need to provide income for other family members. When an informal education program was provided for them, they were eager to learn (Gathenya 2002). With support, some even returned to the formal schools, where they performed well, some proceeding to university and to other post-secondary education/training programs. The education provision crisis is not unique to Kenya (UNESCO 2000) but is indicative of a global trend of non-participation by an increasing number of children that calls not simply for local and international innovative preventive and intervention strategies but for the com-

mitment to transform these strategies into practice. Without resource commitment and political will, all local and global efforts to address the gaps turn into rhetoric. Solutions that address gaps in education alone have not worked before, and we now acknowledge the need for an integrated holistic approach that takes into account the basic human needs of excluded groups more broadly.

Conclusion

Throughout this article, we have reflected on our similar educational paths that brought us to Canada to pursue graduate studies and considered how both of us could never have succeeded without the determination, sacrifice, and support of our families and communities. As girls and the only children of our respective families with PhDs, we understand the opportunity lost when so many Njeris, Nyokavis, and other Kenyan children are denied such chances. To date, both of us continue to support those among our siblings who did not make it to secondary school, despite the fact that some had passed the secondary entrance examination and wanted to proceed but could not afford the required levies. This is common among Kenyan families, who often have to choose to educate just one child – as this is all they can manage to do – with the hope that the one child will find employment and earn enough to look after the rest of the family. We also realize that we were among the lucky few not to have met the misfortunes of Nyokavi's and some of our peers, who were thrown out of school once it was known that they were pregnant. As late as 1991, the education policy included pregnancy as one of the grounds for expulsion from school. Quite obviously, some policies and strategies geared for educational improvement and articulated in Kenyan key policy documents (see, e. g., Republic of Kenya 1998) also contribute, perhaps often inadvertently, to the exclusion of children from certain socio-economic and cultural backgrounds.

There is a powerful correlation between the incidence of poverty, low enrolment, poor retention, and unsatisfactory learning outcomes (Dei 2000). Ensuring that girls and boys benefit equally from education requires nothing less than the integration of gender, class, regional, and other equality concerns into the design and implementation of relevant inter-sector policies and strategies. The importance of gathering and carefully analyzing reliable desegregated data at local, national, and international level is evident. Further, ensuring that equity is enshrined in

the educational system will require a firm commitment from all levels both within the educational system and governmental hierarchies.

To achieve the EFA's stated goals of educational improvement, the government of Kenya has acknowledged the need to rekindle the spirit of *Harambee,* self-reliance, in an environment of improved professional work ethics and with the commitment to providing basic services for both the individual and the public good. The African philosophy of mutual respect, responsibility, and accountability means that the government can count on its people's support, and vice versa, only if both parties are ready to keep their side of the bargain. Only through such a collaborative approach can the government hope to deliver on its promise – made at the attainment of independence in 1963 – to ensure the equitable distribution of resources, including equal access to education regardless of class, race, creed, ethnicity, and geographical location.

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Unexpected Learning by Neophyte Principals: Factors Related to Success of First Year Principals in Schools

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This paper reports the findings related to the International Beginning Principals study, which examined factors perceived by first year principals to both complicate, and account for, first year principalship successes in rural jurisdictions. Specifically, for this paper we deal with factors seen as significant in establishing oneself as a first time principal in a rural Canadian school. The general findings from this study centred on training and experience related to administration of schools. Many first time principals in rural schools had limited specific preparation for the principalship, or other related administrative roles such as the vice principalship. Such findings have taken on more importance in the last several years as school districts find it increasingly difficult to recruit principals for smaller rural schools.

Introduction

Renihan (1999) reported, 'School systems everywhere are finding out that it is difficult to find candidates willing to assume leadership positions, particularly at the school level. People are not coming forward to apply for school level administrative positions' (p. i). We know that the principalship is a complex role that involves a multitude of interdependent factors and influences. Experienced principals have developed their skills through experience and training. Of course new principals need to

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be aware of the factors that will most help them to establish patterns, attitudes and behaviours of success as administrators. In this study, all the participants were new principals in rural schools, most of whom did not have the advantage of previous administrative experience. Also many of these new principals assumed their positions of first principalship with little, or no formal training in administration, as unlike many jurisdictions, preservice training for the role of the principalship was not the norm.

Following a brief discussion on the purpose of the study and the methodology we provide the three main sections of this paper. For the purposes of this article we have selected several of the many themes of interest from the findings of the study to present to readers. The first of these selected themes relates to the unanticipated experiences of first time principals with respect to: the amount of work/time required, staff related issues, administrative tasks, leadership and role expectations, parent interactions and board office items, the impact on the principal's personal life, and personal skills required to do the work of principal. Secondly, we discuss the respondents' sense of unpreparedness as we describe what our participants said were the most important things new principals could expect to deal with (and should learn about beforehand) during their first year in the role. Here we note their focus on particular administrative duties, especially the function of personnel supervision. Thirdly, we highlight some of the participants' views on what constitute factors and influences that had a significant impact on their success as first time principals.

The Purpose of the Study

The themes discussed in this paper were drawn from data collected as part of a larger study on the neophyte principal. The data for this article were gathered from a single province in Canada, as part of the International Beginning Principals Study (IBPS). The larger and ongoing project involves researchers and schools from seven countries in Asia, North American, and Europe. In several components of the IBPS, researchers have used similar or equivalent methodologies and instruments to gather and compare findings. There are also aspects of the larger study where researchers have undertaken to experiment with the methodologies to either bring further description or explanation to the life-worlds of neophyte principals.

The purpose of this particular study was to gain insights and under-

standings into the perception of the neophyte rural principals' experiences as first time principals using an iterative, electronic and dialogical inquiry methodology over a six-week period. The following research questions guided this study: What factors do principals see as the most important in establishing themselves successfully in their first principalship? Secondly, what examples from their experience might these principals share to provide new administrators with insight into the means by which first principalships are most likely to be successful?

Methodology

For the purposes of the study a rural school was defined as one with 250 or fewer students and situated in a community of fewer than 10,000 people. Our participants were not known to each other. Superintendents of Education in rural districts were contacted and permission was obtained to contact the principals and ensure their participation. Respondents were first year and, in some instances, second year principals. In all cases we asked that these principals delimit their responses to their first year experiences as a neophyte principal.

An initial list of neophyte principals was developed through soliciting contact information from various jurisdictions (school districts, professional associations, and the provincial government). In all a total of 108 principals were asked to participate. Initial letters of invitation and explanation were faxed to qualifying principals, with 53 agreeing to participate. Data were gathered through four sessions of electronic inquiry, emails and faxes, to these 53 principals. We experienced a ten percent attrition from the beginning of the study to the end of the fourth iteration (five principals dropped out after two iterations and one re-entered for the third session). Three of the participants preferred to receive our inquiries and respond through facsimile rather than e-mail. We accommodated this preference. The first electronic inquiry asked the participants to respond to several initial questions concerning their first year of principalship. The three subsequent sessions of inquiry were built from the responses of the participants to the questions or syntheses of responses from the previous inquiry. The responses were gathered, summarized and analyzed for themes by a 'first reader.' Concurrent with this, a second reader reviewed the participant responses to questions to determine themes. A reconciliation of two 'readings' resulted in a synthetic summary, which was provided to the participants in iteration, two, three and four, along with the next set of questions. The subsequent questions

were ones that were derived from and related to the syntheses. We called these inquiries 'electronic Delphi' sessions, as the participants built on the responses and themes as these were developed through the reciprocal nature of the sessions. The participants were not directly exposed or identified to each other, except through the synthesized and mediated information derived from the researchers-participants exchange.

Our emphasis in this article is limited to the qualitative responses of principals. All of the themes presented, herein, are drawn from comments from the participating principals. However, the relative strength or force of articulation varied, qualitatively and quantitatively, from principal to principal and from theme to theme. These variations are not represented, as it is only our intention to bring the content of these themes forward in a largely descriptive, yet somewhat interpretive manner.

Unanticipated Experiences

In the commentary responses of several principals, it was recollected that the actual work and world of the principalship was quite different from what they had observed of others prior to becoming principals. In their own words, more than half of our participants indicated that they had not understood, as fully as they anticipated, what the role of the principal entailed. The reality was that those new to the role were often surprised by the complexity of the role and related demands. Their first year experiences were well beyond their initial perceptions and expectations of the principalship.

UNANTICIPATED AMOUNT OF WORK AND TIME REQUIRED

In general, principals spoke about the unexpected amount of time required to do their work. One principal commented, 'Time, time, time! You do not realize the time it will take.' Respondents identified the time required and frequency of meetings as an unanticipated expectation. One respondent stated, 'Meetings, meetings, and more meetings . . . . I didn't understand how much time meetings were going to take up.' Another respondent was not aware of the 'amount of work that goes into planning a staff meeting.' Still another respondent spoke of the unanticipated amount of organizational skill required to be a principal. 'I was unaware of the organization skills that would be needed to run a school.' We found that principals had not anticipated that a certain amount of autonomy with respect to demands for their time was lost, upon assum-

ing the principalship. This profound to subtle variation from their previous educational experiences startled some and was softly resented by others.

UNANTICIPATED STAFF RELATED ISSUES

Respondents said that mediating for and between staff was an unanticipated part of the job. One respondent commented that, 'the amount of mediation between staff members' was not expected. Other respondents stated that they did not expect that teachers would so easily attempt to give their discipline problems to them. One principal commented that the 'expectation of staff that you [as principal] can more effectively deal with problems of discipline than they themselves can,' was a surprise. Another principal was surprised to find 'that I was responsible for situations that I did not create. This happened particularly in areas of discipline.' The participants identified other unexpected staff related items that covered a wide range of areas from a perceived a lack of professionalism and being misunderstood by teachers. Of course, dealing with teachers' personal issues and facing resistance from some staff members cannot always be predicted, but the frequency and intensity of such 'dealings' was unanticipated by our study participants.

Some principals did not anticipate the scope and complexity of teacher expectations. One principal suggested that teachers expect 'you will back them no matter what.' Another administrator was surprised how much 'direction and organization the teachers looked for.' In the area of teacher supervision, one principal was not aware of the 'procedures to be followed and put into place when teacher competency was questioned.' Instructional leadership was an area that principals felt they were expected to have expertise in. One principal said there were 'expectations around instructional leadership (e. g., you are expected to be knowledgeable about all curricula from K-12 (every subject).'

UNANTICIPATED ADMINISTRATIVE TASKS

Plant maintenance and facility issues, were identified as unanticipated duties by some respondents. One administrator did not know it would be necessary to have knowledge in 'construction and the general workings of maintenance.' Related to this task area another administrator had not anticipated the 'degree of time necessary for building and maintenance issues.' Yet another principal did not realize 'the time and effort devoted to maintenance items.' This participant had 'furnaces . . . replaced

. . . renovations . . . [and] roofing projects' in the first year in his/her new role. A principal explained, 'the biggest change was being in charge of the school budget [although] I had good advice from our school district secretary.' Yet, another principal was not prepared for the program planning process. 'Developing a program plan for the following year was also something I did not expect, especially in December when I had barely identified what was going on.'

UNANTICIPATED PARENT AND SCHOOL BOARD OFFICE ITEMS

Respondents stated that dealing with difficult parents was unanticipated. It was not that these first time principals were oblivious to parental issues but rather they had not anticipated the tensions, angst and energy that each of these situations creates for the role of the principal, and all concerned. One respondent expressed surprise about the 'amount of "parenting the parents" I have to do.' A further comment was that parents 'expect[ed] immediate answers.' Another principal identified the problem of getting parents to talk to teachers. The principal 'never realized how upset parents could get over minor matters and how reluctant they were to see the teacher first.'

Other respondents identified items relating to Boards of Education and central office. A principal commented, 'I did not think I'd find solace in senior administrators . . . [but] I did.' Other principals commented that they had not anticipated dealing with board members that had 'their own agendas.' Another principal was unaware of the significance of board policy and the expectation to follow it. Still another principal had questions about the limited background and experience of central office staff and board members. The principal's perception of competence required of such staff had altered upon assuming the role of principal and observing these individuals more closely.

UNANTICIPATED PERSONAL SKILLS REQUIRED

Our study administrators identified different skills that they had not anticipated they would need. Of particular note were those skills related to respecting confidentiality, time scheduling, and mediation skills. These skill-sets were identified as ones not anticipated to the degree they were required. One principal stated that you had to 'think like an administrator, not a teacher.' This comment is consistent with Sigford's (1998) view that, 'new principals need to see themselves as administrators and not teachers anymore' (p. 14). Another principal spoke about needing highly

developed skills of diplomacy. 'Whether it is a "job expectation" or not, one of the hardest things is being diplomatic . . . and keeping my mouth shut and some of my gut reactions to myself.'

It is interesting that all our administrators would have observed principals in action from their more experienced perspective as teachers; yet, many were still surprised by the amount of work and time required as part of the position. Looking across the categories and combining responses for the amount of work/time required and the learning of administrative tasks, these two categories represented 40% of the responses. For nearly half of the first time principals, there were feelings that they were less than adequately prepared, in part, because they had not had an adequate grasp of what the principalship would actually require of them.

Sense of Unpreparedness for First Time Principals

The unanticipated experiences drew us to the question of the new principals' sense of unpreparedness. We were interested to know what new principals felt least prepared for in their new role. An iteration of the electronic Delphi sought to generate a list of tasks/areas for prospective principals who might follow those in our study. We hoped that these insights might guide future beginning principals in their preparation for school administration. The main categories from the responses were related to: Teachers and supervision, dealing with parents, and time/work.

Slightly more than half of respondents identified teacher related tasks and supervision as something they were least prepared for. While supervision will be discussed in greater detail later, here we will say that principals related to us their difficulties when dealing with teacher competency issues. One principal recounted, 'dealing with weak teachers,' while another talked of, 'disciplining/investigating a teacher when a complaint has been made.'

About one quarter of the responses were related to parent issues. Responses recounted mostly negative experiences with parents, which included 'parent gripes,' 'difficult parents,' 'being bullied by some parents,' and 'irate parents.' Many of these new principals felt they were not prepared for negative aspects of dealing with parents. One principal summed up the lack of preparation for dealing with, 'the fury of parents when they are upset with a teacher,' and concluded that, 'nobody told me you needed a very thick skin and the negotiation skills of the United Nations.' Terry (1999) advised principals to clearly 'articulate their belief systems, to better prepare themselves to resolve parent conflicts' (p. 29).

Twenty-five percent of the respondents cited work and time demands as areas in which they lacked adequate preparation. One principal recounted being unprepared for the 'amount of work and the amount of time the work would take.' A further comment was that 'with very little administration time I worked to 11:00 or 11:30 every night, including Saturday . . . . I also worked Sunday afternoon and some Sunday evenings.' A principal of a K-12 school discussed the time demands and the effect in the classroom, as follows: 'The incredible demands on time . . . all of the time. I felt I was always a very organized and effective teacher. My teaching time was often interrupted by admin demands thus affecting my ability to maintain an atmosphere conducive to effective learning right in my own classroom.'

It is interesting to note that the three main themes that principals identified as areas they felt least prepared for are areas in which, as teachers, they would have had some exposure. Parent-related situations certainly would have occurred for these new principals during their times as teachers. Dealing with fellow staff members and the pressures of teachings are common to all typical teaching situations. Yet as beginning principals, these former teachers felt unprepared in these areas. These data suggest that many teachers really did not understand the duties, pressures, and challenges of their schools' principals and, perhaps we might even suggest that some have had unrealistic perceptions concerning the nature of the principalship.

We asked first time principals what they felt were the most important tasks that they needed to get 'a handle on,' in order to be successful. Respondents submitted a variety of items that they felt were important for first time principals. For the purpose of this line of questions we will focus on specific tasks and not general ideas. The two most often mentioned categories were administration-related and staff-related tasks. Fewer of our participants mentioned categories student-related, board related, community-related, and program-related than one might have expected.

ADMINISTRATIVE TASKS

The question becomes, to what extent are first time principals prepared for these various critical tasks? Previous analysis in this study has shown that many first time principals did not have adequate administrative experience or training. First time principals do not have the experience or training in these critical tasks will be challenged to effectively perform

their duties. Should first time principals who do not have the experience and training be given additional administration time to develop the skills to perform these critical tasks effectively?

Dealing with students, Community issues, and School Board tasks were also important issues for which first time principals needed tp develop skills in order to better address them. Student discipline was the main theme of the student related responses. One principal tied together student and staff related items by saying that 'developing a school discipline policy that is workable and that the staff has agreed to enforce' was an important task for first year principals. Other responses for important student-related tasks included: working with the student representative council (SRC), student team building, recognition of students, working with graduation committees, and being involved with special needs students and their programs.

Other tasks identified were related to Boards of Education. Preparing for and attending board meetings were seen as important. One principal found this newly acquired knowledge shortened the time needed for the preparation of reports to the Board as he/she developed a 'template [to] enter any new information for each meeting.' One principal stated that it was important to 'work closely with parent councils and involve them in the school vision . . . or perhaps involve them in formulating the school vision!' Another administrator commented on the role of the local board of trustees and the skill needed to deal,

> . . . with the local politics and how it impacts on decision making at both the Board of Education and Parent Council level. I am not used to dealing with decision-making in a non-rational environment and for the sake of small local groups as opposed to the common good. Having the tact to deal with that day after day takes practice and a real talent.

The area of student discipline was mentioned a number of times. In fact, nearly half the responses in the student-related category concerned the successful establishment of effective student discipline. However, the most obvious and recurrent theme in our inquiries was that of staff supervision. Participants identified staff supervision as a critical task. Yet many new principals reported that staff supervision was perceived as one of their weakest areas. In the final section of this article we share some of our findings with respect to this supervisory role and related functions.

STAFF SUPERVISION IN THE FIRST PRINCIPALSHIP

Twenty-one percent of the staff related tasks involved staff supervision. The number of responses indicates that staff supervision was seen an important task for new principals. One principal said, 'teacher staff supervision is still [the] number one' task for the new principal.

Knowing that developing skills in staff supervision has been reported to be a critical skill, as identified by 450 principals in California (Schmieder and Cairns 1996, xvi). We asked our first time principals to describe their initial experiences with personnel supervision. We were also curious about the types of training or experience that they brought into this aspect of their work. The respondents submitted a variety of items that were grouped into the following five categories: initial experiences, expectations given, how did you feel, training received, and advice for new principal.

Initial Experiences of Staff Supervision

Several of our particular participants said they did not have much to do with staff supervision in their first year of principalship. Participants typically indicated that their superintendent of education was responsible for staff supervision. One new principal said, 'It had never been done in the district.' A principal indicated the superintendent initially handled staff supervision but, 'as the years have gone on, more has fallen onto the principal.' The remaining participants had various levels of involvement in staff supervision. One principal said the expectation was for principals to supervise one-third of the staff each year. Another principal stated that the district, 'asked principals to do nearly all the supervision.' A further comment was that supervising new staff was not a problem but that it was, 'hard to be as open as needed for improvement when part of the process was a final report.' For the first-time principals in this study population, the fact that they were in-scope and also considered teachers, with membership in the teachers' union, complicated this role and related expectations.

Expectations for Staff Supervision

Slightly over half of the respondents stated that the expectations for staff supervision were outlined in Board-level policy. Fewer respondents made comments about having been simply 'given' expectations. Some respondents commented that they specifically received supervision expectations from their respective superintendents of education.

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Irrespective of the source of the supervision expectations, and across the categories, almost half of the responses suggested these expectations were less than adequate. One principal said that, 'the only expectation from the superintendent was that I be in the classrooms.' Another principal cited that the only expectation given 'was when the reports [were] due.' Further comments included not being given any specific instructions regarding teacher supervision and that the 'expectations and purpose were poorly defined.' One administrator said, 'I was unclear as to why I was supervising.' A further comment by an administrator related to a frustration with the lack of clear direction and unclear expectations for supervision. Speaking about the supervision expectations one principal said,

> There were none, as we did not have a teacher supervision and appraisal policy at that time. There was an unwritten expectation that I should immediately be able to improve the instructional capabilities of some of the so-called 'worst teachers' in the school and if they did not improve then I was to 'fire' them. This of course is ludicrous but it was an expectation of both the superintendent and the board of education.

Respondents indicated that the superintendent, or district policy, provided adequate expectations for teacher supervision. One principal commented that the superintendent 'clearly expected that the principal supervised teachers and was an integral part of the evaluation.' Further comments were that 'expectations were to be consistent with district policy' and that expectations were 'set out by central office and teachers are aware of them.' Sergiovanni (1995) agrees the, 'principal's evaluation responsibilities ... include reviewing and regulating performance, providing feedback, and otherwise tending to standards of goal attainment' (p. 4).

How First Time Principals Felt About Staff Supervision

Seventy four percent of our respondents stated that they initially felt uncomfortable in their supervisory role. One administrator recounted feeling, 'very unprepared and lacking in skills to effect change.' Another administrator said, '[I] felt out of my depth, especially with teachers who had more teaching experience than me.' Many of those who indicated that they felt uncomfortable at first, commented that they grew more confident in this role with experience. One principal was, 'scared at first

but . . . grew confident with practice and encouragement . . . it would not have been successful without the support of my staff.'

The minority of respondents stated they felt comfortable with staff supervision initially. While one administrator simply found, 'teacher/staff supervision has been both enjoyable and demanding.' Another first time principal felt better prepared as he/she was more 'comfortable in the role of teacher supervisor because I have had training.'

Background Preparedness for Staff Supervision

Almost sixty percent of the responses indicated that, as first time principals, they had received no training, or very little training in supervising teachers. One principal felt she was, 'thrown into teacher supervision with no training and [only] a bit of information that I received at the Principals' Short Course.' The training described included university graduate classes, provincial school-based training, and administrators' council training modules in supervision, curriculum-based inservices, district supervision seminars, and general comments about training. One principal recounted taking a, 'supervision graduate class that was experiential and this was life saver.'

A further theme was to keep 'eyes and ears open' all the time while working with staff. Working with staff and getting to know their teaching styles was offered as a way to gain specific insights into teachers' strengths and weaknesses. One suggestion was to pop into classes frequently to get a sense of what is happening in the classrooms. Another principal summed up the use of reflective supervision as follows:

> I started with 'walk-abouts' to get a sense of what was going on in classrooms. I then began full period visits in each teacher's classroom and wrote a 'report' on 'what was happening in the classroom'. The teacher and I discussed the lesson soon afterwards. From there, in a subsequent visit, I focused on creating reflection questions for the teacher and used this as a basis for encouraging professional growth. If there was a teacher who appeared to be having difficulties, I visited them again and when needed, I gave specific directions for areas to focus on.

Robbins and Alvy (1995) reported that, 'if you think something is important, like visiting classrooms, build it into your schedule' (p. 51). The data suggest that principals in districts that had board policies for staff

supervision were more likely to see themselves as being successful in performing teacher supervision. However, nearly half the respondents saw the expectations for staff supervision as inadequate. Over half of the participants had little or no training in staff supervision. Many of the suggestions for staff supervision involved being visible and being aware of situations. The study data suggest that staff supervision was one area of weakness for first time principals; unclear expectations and insufficient training were factors linked to this perceived weakness.

Responses to a specific question on supervision generated some candid and revealing responses from the participants. Three of every four respondents said they were initially uncomfortable with the supervision expectations they had been given. Participants were concerned about supervising staff that were older and had more experience. Some participants were concerned about the separation that they felt between themselves and their staff because of the evaluative role in supervision. Almost one out of four of the respondents indicated that they had adjusted to their supervision role as time went on.

Our respondents' comments on administrative preparation and surprising time demands caused us to wonder if first time principals in these rural schools had the background and administrative time to develop good staff relationships and be engaged in the supervisory process? Did principals who felt uncomfortable supervising feel that way because of a lack of role adjustment, lack of clear expectations, or a lack of preparation for staff supervision?

The data suggest that supervision expectations were not clearly communicated to first time principals. Just over one half of the respondents indicated that their school districts had a policy for supervision. Four of every 10 respondents felt the expectations for supervision less than adequate. In those districts where there was a policy for staff supervision, a minority of the principals saw the expectations as inadequate. The data suggest that districts that have policy for staff supervision communicate their expectations adequately to new principals. The implication for the new administrator is that they should be clear on the supervision expectations that the district and superintendent have for them. Beginning administrators need to realistically assess their supervision skills and ask for help if they are not prepared for supervision duties. Those administrators who did not initially have staff supervision responsibilities found that they were now engaged in the supervisory process. The data suggest

that a lack of training and preparation for the supervisory role was common for first time rural principals. There was no indication in the data from this study that first time principals received such training through their boards of education.

Factors in a Successful First Principalship

We asked principals to think about the factors that they believed were the most significant in establishing a first principalship and to describe the five most significant factors that contributed to establishing themselves as a principal (e. g., training, experience, and personality). The responses were grouped into fourteen broad categories listed in order of frequency as: character traits, experience, leadership and interpersonal skills, personality, training, support from central office, working with staff relationships, personal motivation, support systems, situational considerations, support from colleagues, patience, and risk taking as related to standing on one's principles.

Character traits were identified as: strong work ethic, imagination, ambition, confidence, and consistency. One respondent said 'A strong work ethic leads to credibility. This is especially true in a smaller/rural school. If you are not willing to lead by example, people will not be as likely to put in the extra effort.' Teschke (1995) agrees that effective leaders are those who are visible and prepared to put in the necessary effort to lead the school (p. 10).

'Experience' was the category attracting the second most responses, including: successful teaching, being a vice-principal, and being mentored by an administrator. One respondent said that 'mentoring by an experienced principal' and having them 'available to talk over situations and routine is important. Their experience in scheduling and policy are invaluable to a beginning principal.' Another respondent had 'watched five previous principals work in the school' and had a year of vice-principal experience before taking the job. A former vice-principal thought 'the number one factor [for success] was mentorship through a vice-principalship.' These comments in support of mentoring new principals are consistent with the literature (Adams 1999; Ellis and Macrina 1994; Lovely 1999; Peel et al. 1998).

Leadership skills and interpersonal skills were identified as including: organizational skills, communication, and leadership styles. Interpersonal skills, such as listening and empathy, were also indicated. One respondent said there must be a 'willingness to listen and persuade rather

than dictate.' Another respondent talked about the importance of organizational skills. 'It is very important to be on top of things especially so in your first year. If staff members see that you are organized and on top of things, I feel that things will go a lot smoother for you.'

In discussing 'personality,' while repeat responses were not counted for frequency, it is worth noting that one respondent felt the need to list personality twice. That respondent said first time principals need a personality that, 'is open to hearing others so that they feel heard' and 'is open to sharing decision making with the stakeholders of the decision.' Somewhat reflective of this view of first year principals is the viewpoint of Sergiovanni (1995) who spoke of principals as 'ministers to serve parents, teachers, and students' (p. 127).

Training was seen as an important factor for success in a first principalship. Respondents expressed having university programs and other professional administration inservice in mind, under this category. There was no distinction made between preservice or inservice. One respondent stated that someone in a first principalship needs 'an academic background broad enough to have informed opinions about educational issues.' The same respondent cited the example of special education and the changes within that program. Bergh and Van der Linde (1996) added that principals 'need to take the initiative to learn about curriculum theories and issues' (p. 4). One principal stated:

> My graduate classes leading to my Masters Degree in administration were invaluable in helping me adjust to the dynamic role of [the] principal. These [classes] provided me with the theoretical background to help me understand many of the things that were occurring in a much broader fashion. This depth and breath of understanding led to making higher quality decisions, especially in stressful circumstances that inevitably occur during that first year.

The comments concerning training proved to be interesting in that a minority of the respondents downplayed training as a success factor. Some principals made comments such as, 'training has virtually nothing to do with the job' and 'I don't think you need a lot of post secondary training to be successful as an administrator.' Alvy and Robbins and Alvy (1998) have observed that the new principal, 'often feels unprepared for the role, despite extensive training' (p. 26).

Notwithstanding this, those administrators with training seemed sup-

portive of it, while those without seemed sceptical. We felt it would be interesting to investigate the types and qualities of training that these participants had in order to more fully explore the reasons for their not considering it of much value in their first principalship.

Supports from central office, boards of education, community/parents were identified as success factors by close to ten percent of the respondents. One respondent stated that support from the superintendent and local school board were important, but that 'expectations of each [should] be clearly spelled out in advance.' The literature supports the idea that the duties and roles of local advisory boards must be clear and well communicated (Ubben and Hughes 1997, 68; Bolman and Deal 1993, 30; Sergiovanni 1995, 68). Another principal spoke about 'knowing the community beforehand' as important. A further comment describing the support of the community was that 'in a smaller school it is important to build bridges with the community. You never know when you might need help from them.' The respondents who identified support and working with parents as a factor for success did not describe the ways that they perceived parents showing their support.

Slightly less than ten percent of the participants raised working with staff and establishing a working relationship with them, as factors in their success. One principal stated, 'I learned to use the strengths that were already present . . . making the staff feel involved is very important.' Another respondent spoke about expectations and said, 'I let my staff know what my expectations were . . . . I take a very collaborative approach to leadership within my school and I had to communicate this early, so that staff members knew that their input, when requested, is important.'

Fewer respondents mentioned the remaining categories: personal motivation, support systems, and situational considerations, as factors leading to a successful first principalship. Respondents discussed career advancement and financial incentive as factors. Other respondents indicated that family support was an important factor. One principal said, 'I wasn't afraid to take a risk, which is partly to do with me and partly to do with the support of my family.' Another principal found his 'family was very supportive' when he had been considering the move to administration. Daresh and Playko (1997) emphasize the importance of maintaining personal and family support and to 'keep a personal focus on what is truly important in your life' (p. 101).

Respondents cited the support they had received from colleagues as a factor in applying for their first principalship. One principal commented,

'I was encouraged by my staff to apply for the job.' Another principal had been 'encouraged by . . . fellow staff members to apply.' Respondents agreed that an important factor for them had been that the previous principals had not done a very good job.

Patience, taking risks and standing on one's principles each had garnered responses from our participants. One principal said it was important to 'above all . . . [to] be patient.' Another principal said it was important to stay 'steadfast' to one's principles in the midst of all that is going on. In the area of risk taking, one principal felt the 'willingness to assume risk and its consequences' was an important strategy in establishing a successful first principalship.

Summary and Conclusions

First time principals were often surprised by the high expectations related to their new roles and the sense that they were expected to have answers to the many problems in the school (personal and well as professional). The transition from being a staff member-teacher to becoming a staff member-principal resulted in considerable role confusion for some principals and for their teacher colleagues. Also unexpected, on becoming a principal, was the reality of dealing with difficult parents. These factors contributed to a sense of unpreparedness in the face of unexpected demands on these neophyte principals. Many first-time principals reacted strategically (some more than others) to address their newfound difficulties. A key learning for new principals was centred on concern about balancing work and family life. Many of the issues raised by our beginning principal informants are reflected and informed by the literature.

The general findings from this study centred on training and experience related to administration of schools. Many of the first time principals in rural schools had limited specific preparation for the principalship and only a few had related administrative experience in others roles, such as the vice principalship. The majority of participants had no school-based administrative training prior to their first principalship. Most participants had little or no administrative experience other than their involvement in leadership roles as teachers and rarely as vice principals. The findings of the study indicate that the majority of new principals who had vice-principal experience, or had a mentoring relationship, felt they were better prepared for their first principalship. As to the use of successful teacher leaders, Anderson (2003) raised the question of the

school districts' misunderstanding of teacher leaders as too quickly seeing these people as a ready pool of future administrators. Quite simply some are and some are not. We feel some teacher leaders may well be recruited into the principalship without due consideration given to their need for support in face of less than adequate preparation, or experience as an administrator. Clearly, prospective principals could better understand the role of the principal. The elimination of the vice-principal role in many rural schools may have contributed to the surprises and unanticipated learning experienced by our study participants. We think that exposing prospective principals to the descriptions of our study participants and connecting them with the factors that are associated with success are ways of fostering the development of beginning principals.

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Reflections on 'Management of Global Transitions'

Alan Anov

Receiving the first number of a new scientific research journal is always an interesting moment. I look at the front page, and immediately I was caught by the words Global and International and had to look at the content. The journal proved to address issues that I find extremely important in the world of today and tomorrow, we see a growing internationalisation of companies and the products available in the shops, the education of young is no longer taking place in their home country, we travel an study all over the world, we are more and more living in a 'Global Village or City'. The Education and training of children and young people has to cope with this and here this journal comes in with its articles on recent international research.

Historically, the advancement of general education in a society has increased the standard of living (measured by the economical yardstick); this has led to theses like the one stated in the OECD report from 1993 quoted on page 73 of the journal:

> Only a well-trained and highly adaptable labour force can provide the capacity to adjust to structural changes and seize new employment opportunities created by technological progress. Achieving this will in many cases entail a re-examination, perhaps radical of the economic treatment of human resources and education.

Developments in the educational systems in countries like Denmark over the last fifty years have enabled a larger and larger proportion of the population to obtain full secondary education by adding two to four years of academic studies. This is fully in line with the basic ideas of the thesis.

Analysing the developments in the labour market in Europe over the recent years shows clearly that (as in all biological relateable issues) there is no guaranty that a thesis is correct (the truth, the one and only). At the same time as the educational systems developed and introduced more schooling, training and specialisation, globalisation made production and product development etc. leave the Western European countries for Eastern Europe and Far East. The reason for this was that mass production and labour intensive production are much more sensitive to labour costs than to a general high level of education in the labour force. The needed number of highly skilled labour is either locally obtainable or can be 'imported'.

We see that most of the textile work has left Europe, but also highly skilled work like computer programming is now being done in countries like India. The latest developments show

that companies are now moving their production activities from Eastern Europe to countries like Ukraine and China. Leaving Europe with its highly skilled labour force without work. In Denmark it is at present very difficult for the new graduates to get employment, and unemployment especially among the higher educated is growing.

With the former in mind, reading the paper by David Oldroyd 'Educational Leadership for Results or for Learning?' and David C. Dibbon's paper 'Creating a Culture of Innovation in Canadian Schools' puts emphasis on learning and education not as processes creating a labour force with certain fixed capacities able to manage and carry out certain jobs or processes, but as a process of giving students knowledge and abilities (skills development) to be innovative and learn throughout life. This will eventually also result in new inventions etc. Looking back in history to the early days of the introduction of technology in craft and agriculture it is interesting to see the ingenuity of the 'common' farmer or craftsman. Very interesting examples can be found in the development of different ways of utilising the power of water as source of energy for sawmills, metal working and flour grinding etc.

Living in the countryside of a Europe that is becoming more and more urbanised, and at the same time losing more and more of the basic production (manufacturing), makes it difficult to see what should be the right direction of education and development in order to cope with the challenge. Let me suggest the following:

Back in the latter part of last century there was an attitude to the future that the introduction of computers and technology would solve all problems. Time has shown that it was not quite as simple as that. New technologies and methods etc. not only solve problems but give more new challenges and problems to solve. A decade ago a group of people participated in a series of educational conferences under the general heading of 'Children in the Information Age', discussing the impact and use of IT etc. in education and training. Unfortunately this work was interrupted (ended) by the changes in the political map of Europe taking place in the late eighties and beginning of the nineties. I clearly remember the feeling of direction and being on the right track we had at the last conference in Albena, Bulgaria discussing the development of 'High Level Learning Skills' in students as the target of all education from kindergarten to university. Reading through the papers of Volume one of the new International Research journal 'Managing Global Transitions,' as well as following the global trends, shows me that 'Learning to Learn and Innovate' must be the target of education, enabling the individual as well as possible to adjust to and creatively utilise the possibilities available at any time and place.

Once more, thank you for the initiative and best of luck for the future.

Managing Global Transitions
International Research Journal

AIMS AND SCOPE

The journal *Managing Global Transitions* is aimed at providing a forum for disseminating scholarship focused on transitions. The journal seeks to publish ground breaking work in management research that will provide integrated and diverse perspectives on the processes of change and evolution in a broad range of disparate fields, including systems theory, leadership development, economics, education, sociology, informatics, technology, decision-making theory, and action learning. To further the understanding of transition environments internationally the journal aspires to enhance the availability of case studies and analysis of data from different cultural environments in public, non-profit, and corporate contexts.

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