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20706 (1 of 4)

ORGANISATION DES NATIONS POUR LE DEVELOPPEMENT INDUSTRIEL

RAPPORT FINAL

Projet No. DU/RAF/89/850

DEVELOPPEMENT REGIONAL D'UNE SOCIETE EXISTANTE DE FABRICATION DE MATERIEL DE TRANSPORT AKAKI , ETHIOPIE

PROPOSITION D'INVESTISSEMENT

ELABORE PAR ONUDI POUR LA COMMISSION ECONOMIQUE POUR L AFRIQUE POUR LES GOUVERNEMENTS AFRICAINES

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Novembre 1993

CONTENU

RESUME

Dans le cadre du developpement du systeme des transports dans les pays d'Afrique, un groupe d'experts d'ONU a choisi l'usine ASPF en Ethiopie (voir l'etude No. DU/RAF/99/850) comme la base potentielle pour assurer le developpement des transports routiers dans la region de l'Afrique de l'Est.

L'usine a ete mise en marche en 1989 et elle est solidement equipee en machinerie et en equipement divers. Le programme de production consiste essentiellement dans la fabrication de pieces de rechange pour divers types de machinerie et celle d'outillage a main. La recherche de marketing a ete orientee en deux directions principales du plan commercial pour la restructuration de l'ASPF.

La premiere direction a ete orientee a la production des types choisis de voitures routieres, la seconde a la production de certains composants de voitures et de pieces de rechange pour voitures a moteur.

Dans la premiere alternative (realisation de la strategie de la production des types choisis de voitures), les objectifs principaux suivants ont ete fixes:

- mettre en oeuvre sa propre production des voitures convenables pour la region donnee de l'Afrique se servant des sources de main d'oeuvre, de matieres premieres et de capacites de production locales.
- produire des voitures au prix economique pour le marche non sature.
- produire une partie des pieces detachees pour les voitures produites.

La seconde alternative orientee a la production de pieces de rechange a ete basee sur la volonte de couvrir la demande en pieces de rechange pour les voitures deja utilisees dans la region, ce secteur de marche n'etant a present approvisionne que tres mal.

Sur la base de ce qui a ete mentionne ci-dessus, on a etudie plusieures variantes du plan de la reconstruction de l'usine ASPF:

- assemblage de vehicules routiers
- production de vehicules routiers tout en fabriquant le maximum de leurs composants sur place
- production de composants de voitures pour d autres producteurs finaux
- production de pieces de rechange pour voitures utilisees.

La variante considerant la production de pieces de rechange pour voitures utilisees se heurte au probleme fondamental d'un programme specifique de production et celui de la quantite de diverses pieces de rechange a produire. Cela est du au fait que la diversite des vehicules utilisees dans la region consideree de l'Afrique de l'Est est tres large a cause des importations differentes et le nombre de chaque type est relativement petit.

La variante de la production de composants choisis pour tiers n'est pas realiste non plus a cause de la non-existence d autres producteurs finaux de voitures routieres dans la region.

Pour cette raison, la variante qui prevoit la production de pieces de rechange pour voitures utilisees ainsi que celle de la production de composants pour tiers ont ete abandonnees

considerant leur non-faisabilite.

Etant donne la demande elevee des importations de composants pour l'assemblage final de voitures routieres et vu la mauvaise experience concernant l'approvisionnement du marche regional en voitures completees a partir des pieces detachees importees, seule la variante prevoyant la production de voitures avec le maximum de composants produits sur place a ete soumise a une analyse detaillee.

Cette variante permet de satisfaire suffisamment la demande des voitures routieres sur le marche, minimaliser les frais et exploiter la capacite de production et celle de main d'oeuvre locales.

L'etude preliminaire de faisabilite comprend quatre variantes de la production de voitures routieres dans l'usine restructuralisee de l'ASPF:

VARIANTE 1 - production de 3000 camions par an en regime de travail d'une equipe

VARIANTE 1A - production de 5000 camions par an par roulement de deux equipes

VARIANTE 2 - production de 1500 camions par an en regime de travail par une equipe

VARIANTE 2A - production de 3000 camions par an en regime de roulement de deux equipes

Selon l'analyse economique et financiere, la Variante 1 semble etre la plus convenable tant sur le plan technique que sur le plan economique. Ses caracteristiques principales sont les suivantes:

production nominale	3.000 exemplaires
Total couts d'investissement	122 mil. USD
NPV	55,1 mil. USD
IRR	16,6 %
Periode de remboursement	6 ans

Toute realisation du projet depend des discussions concernant ses caracteristiques et ses conditions avec les representants du gouvernement ethiopien, de l'aboutissement des recherches de l'investisseur convenable ainsi que de l'elaboration d'une etude de faisabilite ou de l'engineering de la variante retenue.

Mots clés:

Region d'Afrique orientale
Usine de pieces detachees et d outils AKAKI
Equipement pour le transport routier
Privatisation
Restructuration de la production
Integration regionale

Liste des abbréviations, symboles et unités employés

PCP	- Voiture de tourisme privee
PCO	- Voiture de tourisme autre
BU	- Bus
TRL	- Utilitaire leger de moins de 10 t
TRH	- Camion poids lourd de plus de 10 t
TNK	- Camion-citerne
TL	- Tracteur de (semi-)remorque
MC	- Motocyclette
t	- Tonne
t/km	- Tonne-Kilometre
kW	- Kilo Watt
MW	- Mega Watt
MWh	- Mega Watt Heure
h	- Heure
l	- Litre
m^2	- Metre quarre
m^3	- Metre cube
kg	- Kilogramme
1 Birr	- 0.2 USD (US$)
ASPF	- AKAKI SPARE PARTS AND HAND TOOLS FACTORY
1 ETB	- 1 Birr
NPV	- Valeur actuelle nette
IRR	- Taux de recuperabilite interieur
CF	- flux des moyens
DCF	- flux des moyens escompte

1.1. ORIGINE ET HISTOIRE DU PROJET

La presente etude du marche des equipements pour le transport routier dans la region d'Afrique orientale et de la restructuration de l'usine de pieces detachees et d'outils AKAKI en Ethiopie fait partie du projet d'envergure No. DP/RAF/89/850 relatif au developpement des produits d'equipement pour les transports dans les quatres regions d'Afrique (Afrique occidentale, centrale, orientale et de Sud). L'etude a ete precedee d'une etude de reconnaissance de la situation dans les divers pays de ces regions et dans plusieures entreprises locales. Suivant les recommandations d'un commite de direction ou les representants de l'ECA (Commission economique pour l'Afrique), UNDP, UNIDO, EPDF, OAU (Organisaton de l'Unite Africaine) et des gouvernements concernes ont pris part, le projet global a ete divise en deux groupes d'entreprises existants dans les quatres regions qui pourraient, apres certaines modifications, contribuer a l'integration industrielle et regionale de chaque sous-region.

L'usine de pieces detachees et d'outils AKAKI en Ethiopie a ete retenue comme convenable pour couvrir la production future eventuelle de l'equipement pour les transports routiers. L'Usine AKAKI a ete mise en oeuvre en 1989, mais a cause des problemes d'ecoulement de ses produits, elle n'a jamais atteint le niveau de sa production nominale.
La production eventuelle du groupe choisi de vehicules et de pieces detachees est a realiser sur le marche local et sur les marches des autres pays de la region.

La presente etude avait donc pour l'objet verifier le marche des voitures dans la region, determiner les demandes du marche, choisir le type convenable de voiture a produire a AKAKI,

proposer la restructuration de la production de l'équipement de transport ou des voitures complètes et vérifier la rentabilité financière et économique de l'entreprise régionale future proposée.

Sur le plan politique et économique Ethiopie aujourd'hui traverse une période de transition qui devrait prendre son terme par les prochaines élections prévues pour janvier 1994. Il reste à voir quelle stratégie économique sera adoptée par le nouveau gouvernement pour atteindre les objectifs proclamés de la privatisation et de l'économie de marché libre. L analyse effectuée démontre cependant, que sans une forme ou autre de privatisation de l'entreprise AKAKI la restructuration efficace de sa production serait très difficile à atteindre. Elle démontre également qu'aucune contribution efficace à l'aboutissement du développement des transports routiers ne pourra être atteinte par simple augmentation de la production existante de pièces et composantes, la diversité des voitures utilisées dans la région étant trop large, ce qui rend impossible toute réalisation de production de pièces détachés en séries. C'est la raison pour laquelle l'étude recommande la stratégie en bloc de fabrication et commercialisation d'un type choisi de véhicule.

1.2. INDICES GENERAUX

Le marché des voitures dans la région orientale d'Afrique est très peu développé, notamment en ce qui concerne les camions ou le taux est de 0.15 véhicule ppour mille habitants. Dans la région il y a une entreprise d'assemblage - FIAT/IVECO dont les entrées sont presque entièrement importées, avec une capacité d'environ 2,500 camions par an, sa production réelle n'est toutefois que d'env. 200 (1990) à 500 (1991) véhicules. La raison en est le manque chronique des fonds convertibles dans le pays

pour acheter les composantes à assembler.

Il n'y existe pas de marche organise de distributeurs, l'importation des voitures est realisee individuellement et de façon absolument desorganisée.

Aucun reseau de garages de service n'est cree non plus, a l'exception de plusieurs centres de service de marque pour voitures de tourisme.

Le transporteur routier principal en Ethiopie est Ethiopian Freight Transport Corporation - societé dont le proprietaire est l'Etat, et qui realise environ 85% du transport de marchandises dans le pays. Le reste est realise par les petits transporteurs camionneurs prives.

Le prix de camion sur le marche varie de US$ 75 000 a 120 000.

La demande du marché futur est directement proportionnelle au:
- niveau du développement du système economique national;
- volume de marchandises transporte;
- croissance du nombre d'habitants;
- niveau du developpement de l'infrastructure dans la région;
- pouvoir d'achat des acquereurs potentiels;
- etabilité politique.

En supposant la variante optimiste du développement, on peut s'atttendre a la demande suivante de camions sur le marche éthiopien:

ANNEE	1992	1995	1998	2000	2005
nombre de camions en unites	2191	3500	5800	8500	10200

Dans l'alternative pessimiste la demande maximale de camions atteindrait probablement les niveaux suivants:

ANNEE	1992	1995	1998	2000	2005
nombre de camions en unites	2191	2400	3000	3900	6300

La difference des deux eventualites reflete l'incertitude du developpement economique future dans la region dans tous ses aspects et du developpement du pouvoir d'achat qui en dependra.

1.3. CONCEPTION DU MARKETING

En considerant la demande de divers groupes de vehicules routiers on voit que la demande des camions legers de moins de 10 t de charge utile est la plus grande. La production de ces voitures est, dans certaines conditions, faisable, sur le plan technique et commercial, a l'usine de pieces detachees et d'outils AKAKI en Ethiopie, qui a ete repere au cours des etudes precedentes en tant qu'entreprise convenable pour la production eventuelle de vehicules ou de pieces detachees.

Le nombre total de vehicules demandes avec la capacite de charge inferieure ou egale a 10 t sur le marche ethiopien peut etre estime de facon suivante (les deux eventualites du developpement prises en consideration) :

		1992	1997	2000	2005
nombre de camions (unites)	optimiste	1527	2500	6000	9500
	pessimiste	1527	2000	2700	4500

Globalement la realisation des camions demandes est prevue de façon suivante:

Type de vehicule	La demande satisfaite par :
Camions lourds de plus de 10 t	importation
Camions leger de charge jusqu'a 10 t	30 - 50 % production a AKAKI 50 - 70 % importation

Les voitures de tourisme ne seraient qu'importees dans la region.

Dans le cadre de la production des camions a l'usine AKAKI, les diverses modifications du modèle de base - camion simple - pourraient être fabriquees - camion-treuil, camions a benne basculante, tracteurs etc.).

Le prix approximatif du produit final - camion, est de US$ 60,850. Ce prix respecte tant les coûts de production que la necessite de competitivite sur le marche regional.

Les faits ci-dessus servent de base pour l'élaboration des variantes de la reconstruction prevue de AKAKI pour la production des camions.

Les courbes de la realisation de production seraient les suivantes:

VARIANTE 1 - production de 3000 camions en régime de travail d'une equipe

annee	1	2	3	4	5
nombre de camions	600	1300	2050	2500	3000

VARIANTE 1A - production de 5000 camions par roulement de deux equipes

annee	1	2	3	4	5
nombre de camions	660	1300	2100	2800	3900

VARIANTE 2 - production de 1500 camions en regime de travail par une equipe

annee	1	2	3	4
nombre de camions	330	900	1200	1500

VARIANTE 2A - production de 3000 camions en regime de roulement de deux equipes

annee	1	2	3	4	5	6
nombre de camions	660	1250	2050	2500	2900	3000

La capacite de l'entreprise est limitee par la capacite de l'atelier d'usinage mecanique existant. Le taux de production des composantes du produit final sur place a AKAKI est d'environ 50%.

1.4. ENTREE DES MATIERES PREMIERES ET FOURNITURES POUR L'USINE

La production necessitera les volumes suivants de matieres:

Consommation des matières principales (en tonnes)

Matière	Variante			
	1	1A	2	2A
Fournitures sous-traitees	13 790	25 281	6 895	13 700
dont les disques	1 050	1 925	525	1 050
	21 000 pc	38 500	21 000 pc	
pneus	1 500	4 583	1 250	2 500
	21 000 pc	38 500	21 000 pc	
batteries	240	440	120	240
	6 000 pc	11 000 pc	3 000 pc	6 000 pc
materiel pour installation electrique	105	192.5	52.5	105
Materiel metallurgique	8 900	16 317	4 450	8 900
dont toles	5 500	10 083	2 750	5 500
profiles, tubes barres	3 400	6 233	1 700	3 400
pieces embouties	1 050	1 925	525	1 050
pieces forgees	1 100	2 016	550	1 100
pieces moulees	1 300	2 383	650	1 300
tapisserie	108	198	54	108
peinture	390	715	195	390
huiles, lubrifiants etc.	300	550	150	300
matieres combustibles	620	1 136	310	620
produits chimiques	200	366	100	200
materiel de service	220	400	110	220
dechets metalliques	1 692	3 102	864	1 692
dechets non-metalliques	320	594	160	320

Les materiaux fournis par sous-traitance sont en partie disponibles dans la région (pneus, pieces en caoutchouc, batteries, démarreurs, alternateurs, radiateurs, filtres, pots d'échappement, vitres, amortisseurs, bandage de frein, ressorts à lames etc.). Une partie de fournitures devra être importée de

chez les fabricants choisis (p. e. moteurs, pieces embouties pour les cabines, essieux etc.).

1.5. EMPLACEMENT, LIEU ET ENVIRONNEMENT

L'usine retenue pour la production des camions - entreprise produisant pieces detachees et outils AKAKI, se trouve environ 25 km de la capitale éthiopienne sur la route principale qui relie Addis Abeba avec le port d'Assak a 950 km de là. Le chemin de fer passe egalement près de l'usine dans la direction Addis Abeba - Djibouti. La position de l'usine est en effet tres avantageuse quant au transport du materiel.

L'altitude est env. 2000 m, la temperature de jour atteint 20 a 25°C.

Sur le plan économique, le type de production prevu peut être considere comme amical a l'environnement. On prevoit l'installation des dispositifs efficaces qui limiteraient la production des substances nocives. Le projet creerait environ 1100 emplois.

1.6. SITUATION DE GENIE CIVIL ET TECHNOLOGIQUE

Le projet technologique et technique de la reconstruction d'AKAKI suppose que le systeme existant de l'atelier d'usinage mécanique sera maintenu entierement pour la production de voitures. Ce système en question constitue donc une limite des projets réalistes. Toutes les installations existantes de l'usine seront utilisées pour le nouveau système de production. Les nouveaux bâtiments comprennent:

- batiment pour assemblage et carrossage;
- batiment de production des installations electriques et de l'atelier de tapisserie;
- reparations;
- halle de transfert;
- entretien central;
- depot de pneus;
- depot de combustible;
- station compresseur;
- depot de gaz;
- depot de dechets.

La surface batie totale de ces batiments est env. 38 mille metres carres dans la variante 1 et 27 mille metres carres dans la variante 2.

Le projet des batiments respecte le sens logique du flux technique pendant la production.

L'expansion prevue de l'usine entrainera son agrandissement d'env. 130 000 metres carres. Du point de vue technique le systeme est base sur l'objectif d'assurer un taux eleve de la production des composantes dans l'usine meme, en fait la production sur place devrait representer 50% de production de pieces constituant le produit final - le camion. Le projet prevoit l'usinage mecanique complexe, le traitement thermique (fonderie, atelier de trempe, atelier de forge), soudage des pieces de carrosserie, vernissage et assemblage. La production sur place prevoit egalement la fabrication des boites de vitesses.

Les composantes importees principales sont notamment le moteur et les essieux. Les demandes d'energie de l'usine sont assurees de façon correspondante. Les eaux techniques usagees sont

neutralisees, l'emission des substances nocives minimalisee.

Les deux variantes de base du projet (Variante 1 = 3.000 vehicules par an, Variante 2 = 1.500 vehicules par an) sont prevues pour l'utilisation des installations par une equipe de travail. En cas d'exploitation par roulement de deux equipes de travail, les variantes sont modifiees (Variante 1A = 5.000 vehicules par an, Variante 2A = 3.000 vehicules par an).

1.7. RESSOURCES HUMAINES

Les travailleurs de la future usine de production de vehicules seront formes a l'etranger dans les professions choisies (environ 50 employes). En outre on prevoit une supervision dans l'usine assuree par env. 30 specialistes pendant la mise en place de la production.

Les nombres d'ouvriers necessaires pour la production de camions dans les diverses sections sont les suivants:

Nombre d'ouvriers

On prevoit les nombres suivants d'ouvriers dans les diverses sections de la production de vehicules:

Section - Cathégorie	Nombre d'ouvriers			
	VARIANTE			
	1	1A	2	2A
Production mecanique	222	371	122	222
dont ouvriers de production	145	250	73	145
cadres	63	100	33	63
Forge	20	39	10	20
Atelier de trempe	24	45	12	24
Fonderie	40	70	20	40
Carrossage et assemblage	552	968	283	552
dont ouvriers de production	356	648	178	356
cadres	151	257	79	151
Tapisserie & installation el.	40	67	20	40
Entretien central	24	43	12	24
Depots de materiels fournis, huiles, combustibles, dechets & gaz	40	70	20	40
Pneus et batteries	9	15	5	9
Autres	129	213	65	129
TOTAL	1100	1900	569	1100
dont ouvriers de production	595	1078	298	595
cadres	357	612	197	357
employes techniq. et admin.	148	210	74	148

1.8. ANALYSE FINANCIERE

Les variantes proposees aboutissent aux resultats suivants de l'analyse financiere:

	Variante			
	1	1A	2	2A
Investissement total (milliers d'US$)	122,000	125,600	80,400	83,480
Valeur act. nette (milliers d'US$)	55,123.2	111,555	4,531.7	83,110.5
Taux interieur de recuperabilite (%)	16.6	19.3	12.22	21.39
Periode de remboursement (ans)	6	6	9	5

Taux d'escompte calculé: 11,5 %

L'analyse a tout logiquement demontre, qu'il serait plus rentable d'utiliser les installations de production par roulement de deux equipement (Variantes 1A, 2A).

Etant donné les problemes tres probables lies a l'organisation du mode de travail par roulement de deux equipes dans la region considerée, ces variantes ne sont cependant utilisables que dans la perspective a un terme plus long.

Dans ces conditions la variante la plus rentable sur le plan financier est la Variante 1, c'est-a-dire celle qui prevoit la production de 3000 camions par an en regime d'une equipe de travail par jour.
En cas de circonstances particulierement favorables il serait possible de modifier la variante facilement en celle de

production de 5000 camions par an en régime de roulement de deux équipes par jour.

COMFAR 2.1 Unido

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Production de moyens de transport -AKAKI
Juin 1993
Developpement de ASDF Ethiopia var.2A

3 années de construction, 15 années de production
taux de conversion:
monnaie étranger 1 = 1.0000 monnaie comptable
monnaie local 1 = 1.0000 monnaie comptable
monnaie comptable :mille USD

Investissement initial total durant la phase de construction

actifs fixes:	76300.00	43.145 % étranger
actif courant:	350.00	100.000 % étranger
actif total:	76650.00	43.405 % étranger

Source de financement durant la phase de construction

Capital social et subventions:	0.00	0.000 % étranger
prêts(étranger) :	43000.00	
prêts(national) :	40400.00	
prêts (total) :	83400.00	51.509 % étranger

Cashflow, issu des opérations

Année:	1	5	10
coûts d'exploitation	36316.10	137840.70	177675.80
amortissement :	4195.09	4379.27	4379.27
intérêts :	5667.20	4816.10	0.00
coûts de production:	46179.29	146239.10	182055.00
% dont étrangère :	28.42 %	30.48 %	30.09 %
ventes totales :	40161.00	222206.70	293038.00
recettes brutes :	-10758.29	53851.33	86131.56
recettes nettes :	-10758.29	23873.32	38759.29
solde de trésorie :	-21263.75	4725.83	41296.33
cashflow net :	-15596.55	26227.30	41296.33

valeur actualisé nette : 11.50 % = 33110.48
taux de rentabilité sur l'investissement total: 21.39 %
rendement du capital social 1 : 22.22 %
rendement du capital social 2 : 30.14 %

Tableaux établis par COMFAR

Investissement initial total	Cashflow
Investissement total en cours de production	Bilan previsionnal
Coûts totaux de production	Etat de recettes nettes
Fonds de roulement nécessaire	Source de financement

Production de moyens de transport -AKAKI
Juin 1993
Developpement de ASDF Ethiopie Var.1

3 années de construction, 15 années de production
taux de conversion:
monnaie étranger 1 = 1.0000 monnaie comptable
monnaie local 1 = 1.0000 monnaie comptable
monnaie comptable :mille USD

Investissement initial total durant la phase de construction

actifs fixes:	74460.00	42.479 % étranger
actif courant:	350.00	100.000 % étranger
actif total:	74810.00	42.748 % étranger

Source de financement durant la phase de construction

Capital social et subventions:	0.00	0.000 % étranger
prêts(étranger) :	42000.00	
prêts(national) :	38440.00	
prêts (total) :	80440.00	52.210 % étranger

Cashflow, issu des opérations

Année:	1	5	10
coûts d'exploitation	29706.98	75747.76	94284.59
amortissement :	4081.06	4195.14	4195.14
intérêts :	5381.60	3845.30	0.00
coûts de production:	39170.64	83788.70	98579.73
% dont étrangers :	26.69 %	37.67 %	38.09 %
ventes totales :	20080.50	113944.50	145425.30
recettes brutes :	-12520.14	18076.74	34632.00
recettes nettes :	-12520.14	8143.53	15584.40
solde de trésorie :	-18402.26	-5664.50	10816.39
cashflow net :	-13020.06	15087.96	18816.39

valeur actualisé nette	: 11.50 % =	4531.70
taux de rentabilité sur l'investissement total:	12.22 %	
rendement du capital social 1	: 36.49 %	
rendement du capital social 2	: 13.08 %	

Tableaux établis par COMFAR

Investissement initial total	Cashflow
Investissement total en cours de production	Bilan prévisionnel
Coûts totaux de production	Etat de recettes nettes
Fonds de roulement nécessaire	Source de financement

Production de moyens de transport -AKAKI
Juin 1993
Developpement de ASPF Ethiopia var.1A

3 années de construction, 15 années de production
taux de conversion:
monnaie etranger 1 = 1.0000 monnaie comptable
monnaie local 1 = 1.0000 monnaie comptable
monnaie comptable :mille USD

Investissement initial total durant la phase de construction

actifs fixes:	111590.00	52.146 % étranger
actif courant:	450.00	100.000 % étranger
actif total:	112040.00	52.038 % étranger

Source de financement durant la phase de construction

Capital social et subventions:	0.00	0.000 % étranger
prêts(étranger) :	70000.00	
prêts(national) :	55600.00	
prêts (total) :	125600.00	55.732 % étranger

Cashflow, issu des opérations

Année:	1	5	10
coûts d'exploitation	42951.34	184610.79	288133.19
amortissement :	6326.64	6784.59	6784.59
intérêts :	0.00	5817.00	0.00
coûts de production:	49277.98	197415.30	295117.70
% dont étrangère .	29.31 %	38.28 %	39.54 %
ventes totales :	39897.00	294817.90	485526.30
recettes brutes :	-14120.98	66245.19	149398.60
recettes nettes :	-14120.98	29810.34	67229.35
solde de trésorie :	-33313.30	-3484.31	71229.34
cashflow net :	-33313.30	29099.34	71229.34

valeur actualisé nette : 11.50 % = 111555.00
taux de rentabilité sur l'investissement total: 19.30 %
rendement du capital social 1 : 59.13 %
rendement du capital social 2 : 25.07 %

Tableaux établis par COMFAR

Investissement initial total
Investissement total en cours de production
Coûts totaux de production
Fonds de roulement nécessaire
Cashflow
Bilan prévisionnel
Etat de recettes nettes
Source de financement

Production de moyens de transport -AKAK1
Juin 1993
Developpement de UDIF Ethiopia var.1

3 années de construction, 15 années de production
taux de conversion:
monnaie etranger 1 = 1.0000 monnaie comptable
monnaie local 1 = 1.0000 monnaie comptable
monnaie comptable :taille USD

Investissement initial total durant la phase de construction

actifs fixes:	111090.00	51.931 % étranger
actif courant:	450.00	100.000 % étranger
actif total:	111540.00	52.125 % étranger

Source de financement durant la phase de construction

Capital social et subventions:	0.00	0.000 % étranger
prêts(étranger) :	69000.00	
prêts(national) :	53000.00	
prêts (total) :	122000.00	56.557 % étranger

Cashflow, issu des opérations

Année:	1	5	10
coûts d'exploitation	36016.19	142053.00	177679.00
amortissement :	6293.14	6708.89	6708.89
intérêts :	7420.00	5607.50	0.00
coûts de production:	50029.34	154449.10	184464.00
% dont étrangère :	29.48 %	39.13 %	39.53 %
ventes totales :	40161.00	229603.00	293038.00
recettes brutes :	-14608.24	58540.36	83722.25
recettes nettes :	-14608.24	22743.39	37675.01
solde de trésorie :	-30296.55	-3751.97	42621.45
cashflow net :	-22876.55	27938.36	42621.45

valeur actualisé nette : 11.50 % = 55123.19
taux de rentabilité sur l'investissement total: 16.60 %
rendement du capital social 1 : 61.37 %
rendement du capital social 2 : 20.38 %

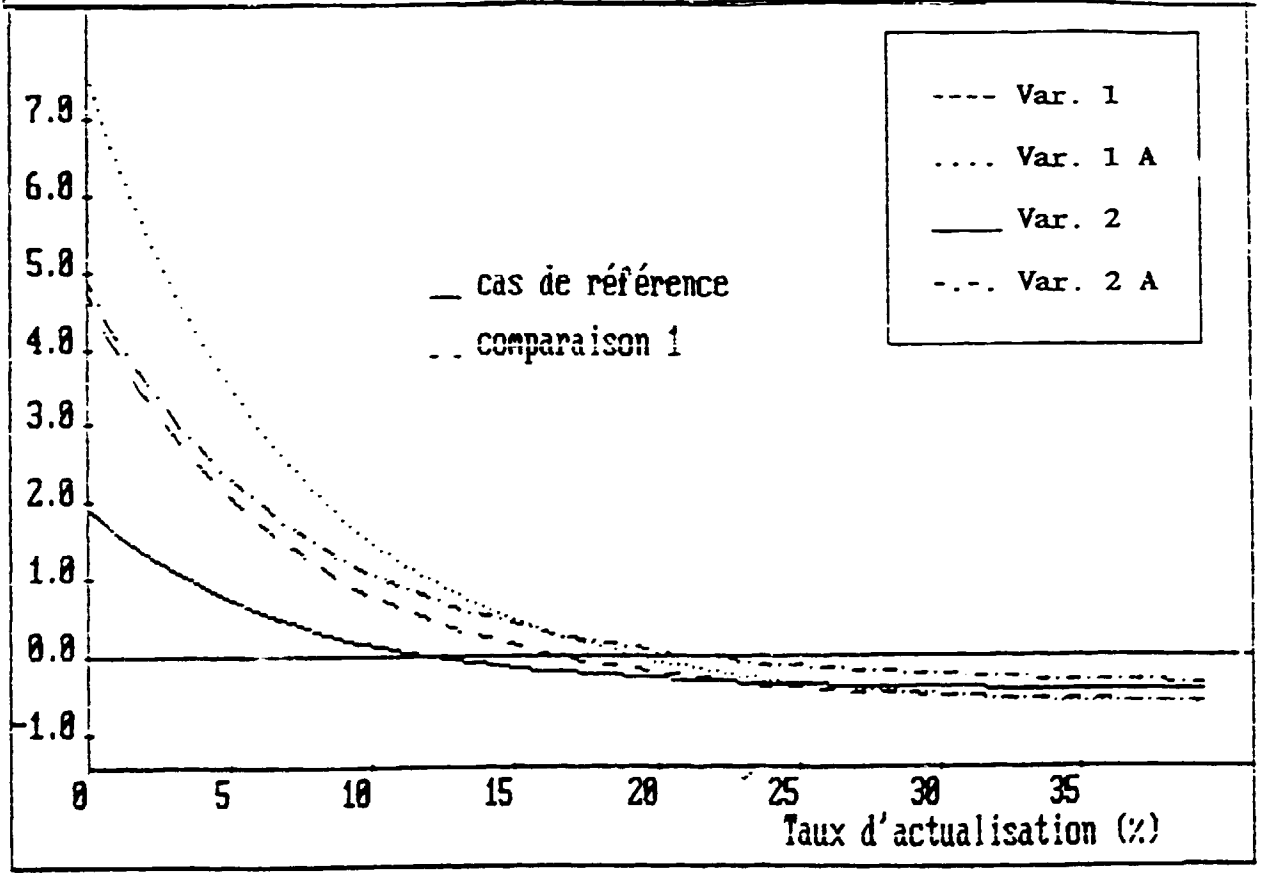
Tableaux établis par COMFAR

Investissement initial total
Investissement total en cours de production
Coûts totaux de production
Fonds de roulement necessaire
Cashflow
Bilan prévisionnel
Etat de recettes nettes
Source de financement

Cashflow net actualisé

10^5 mille USD

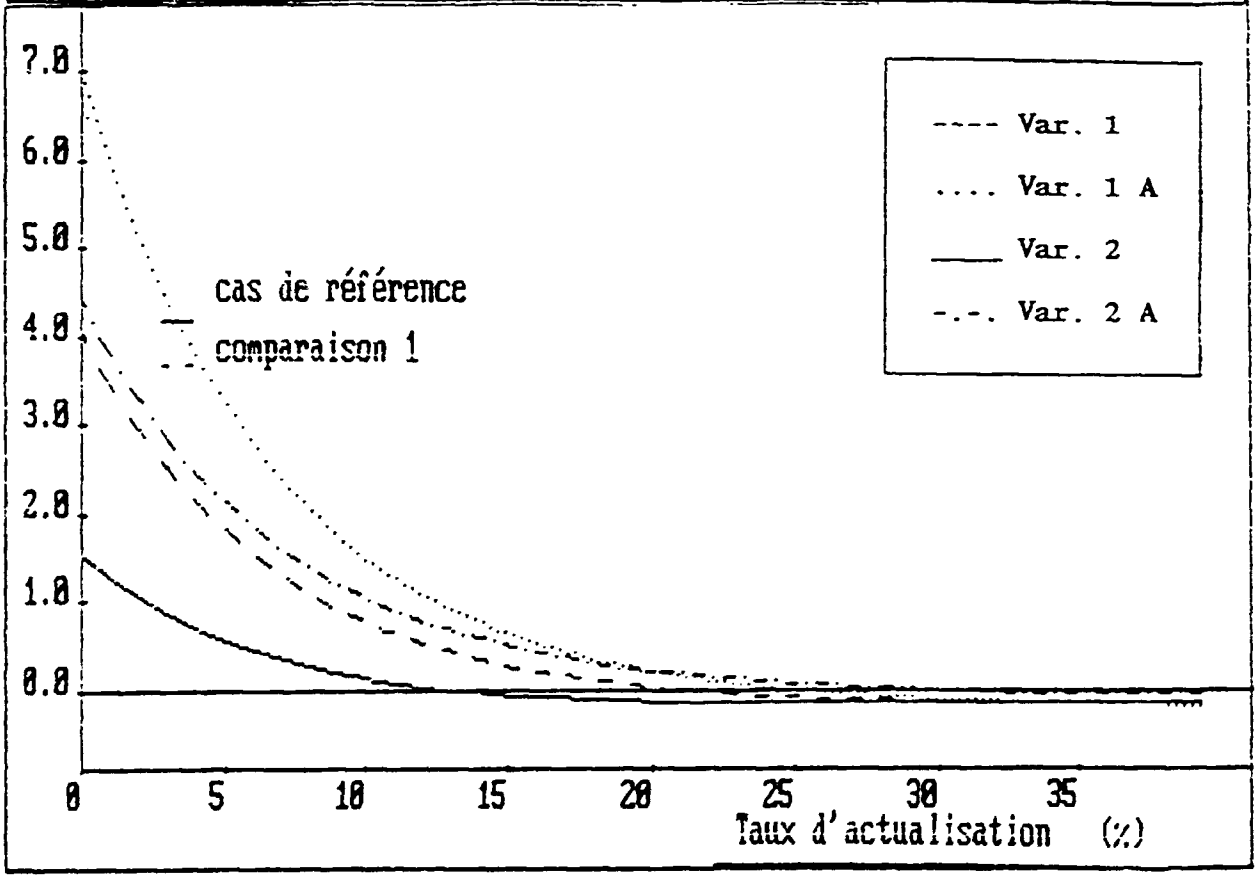
Graphe de comparaison



Rendement actualisé

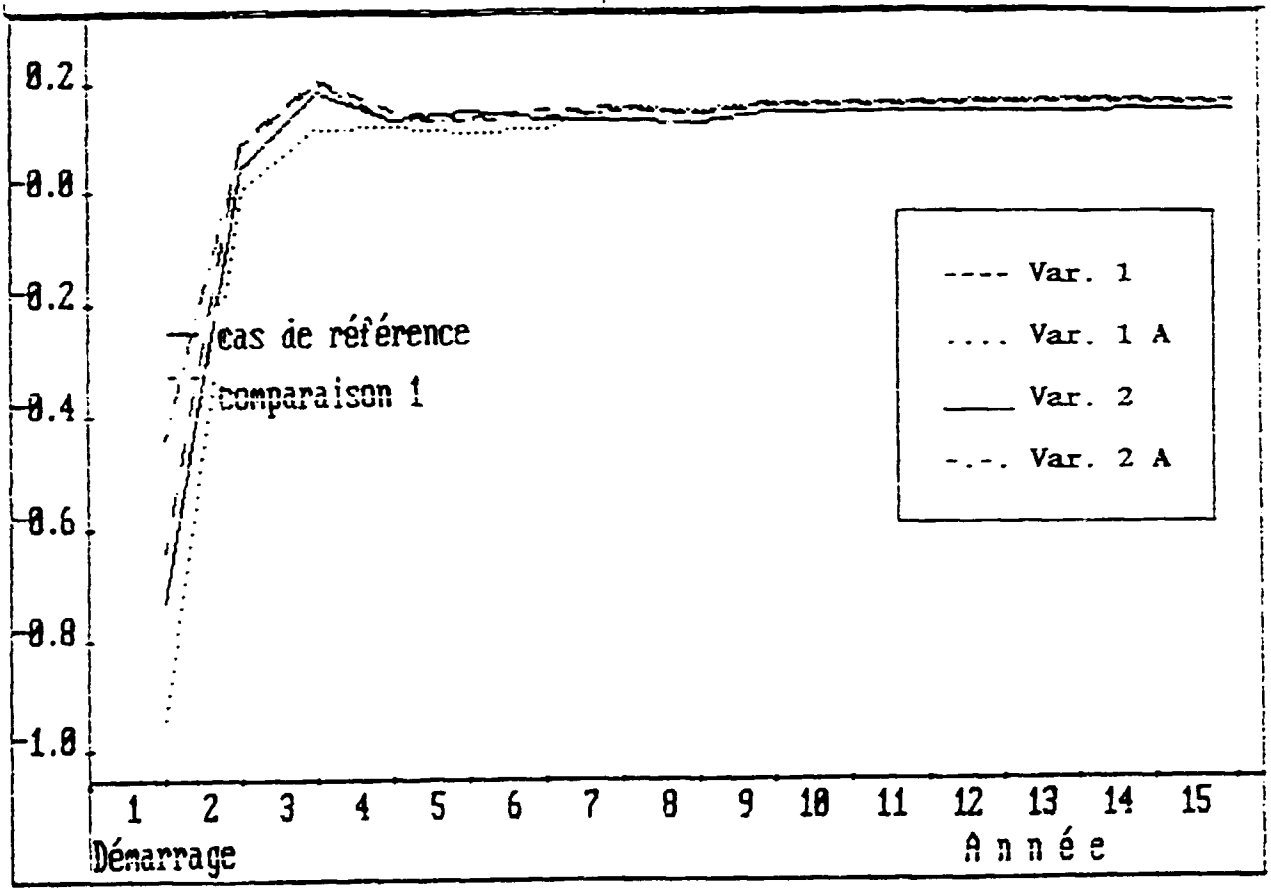
10^5 mille USD

Graphe de comparaison

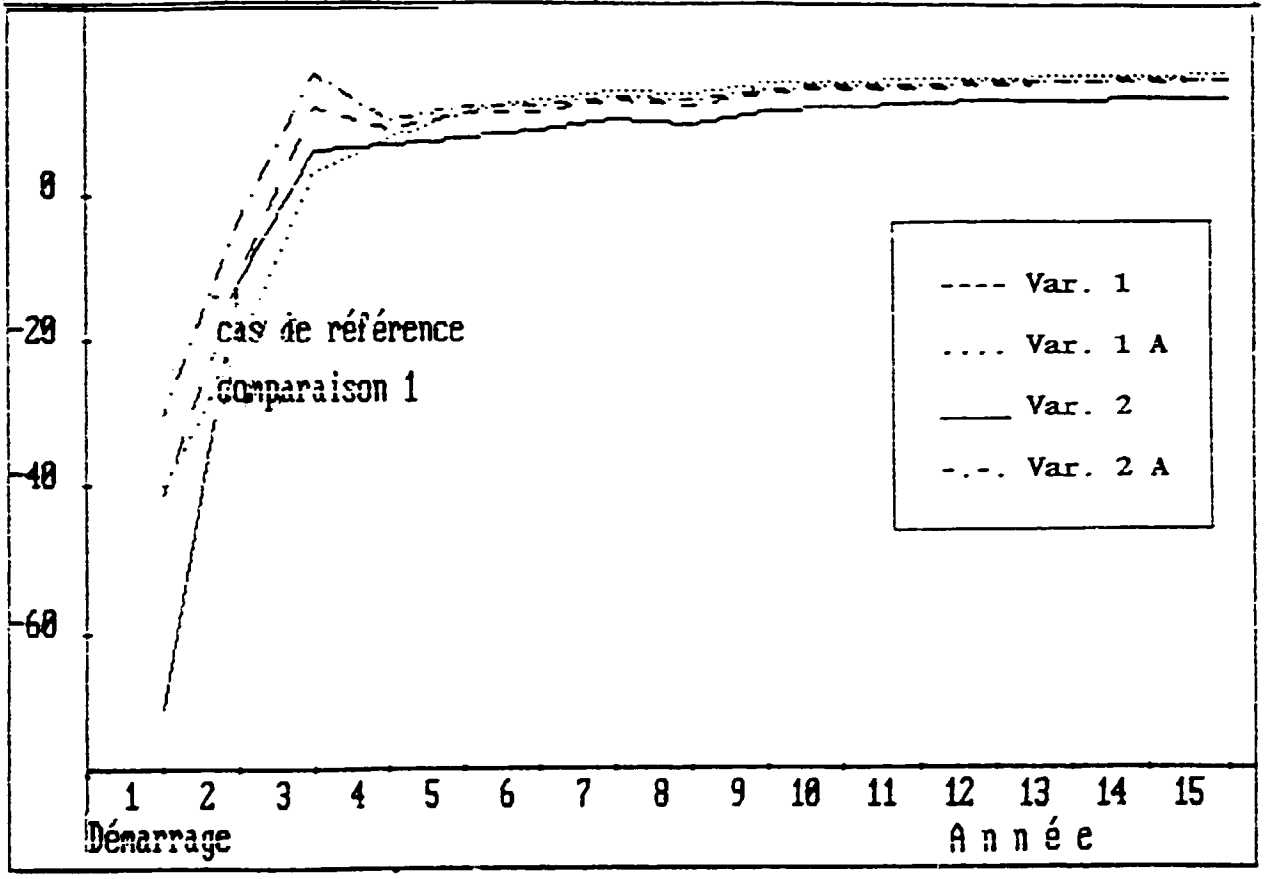


Cashflow net / total des ventes | Graphe de comparaison

10^2 Ratio en (%)

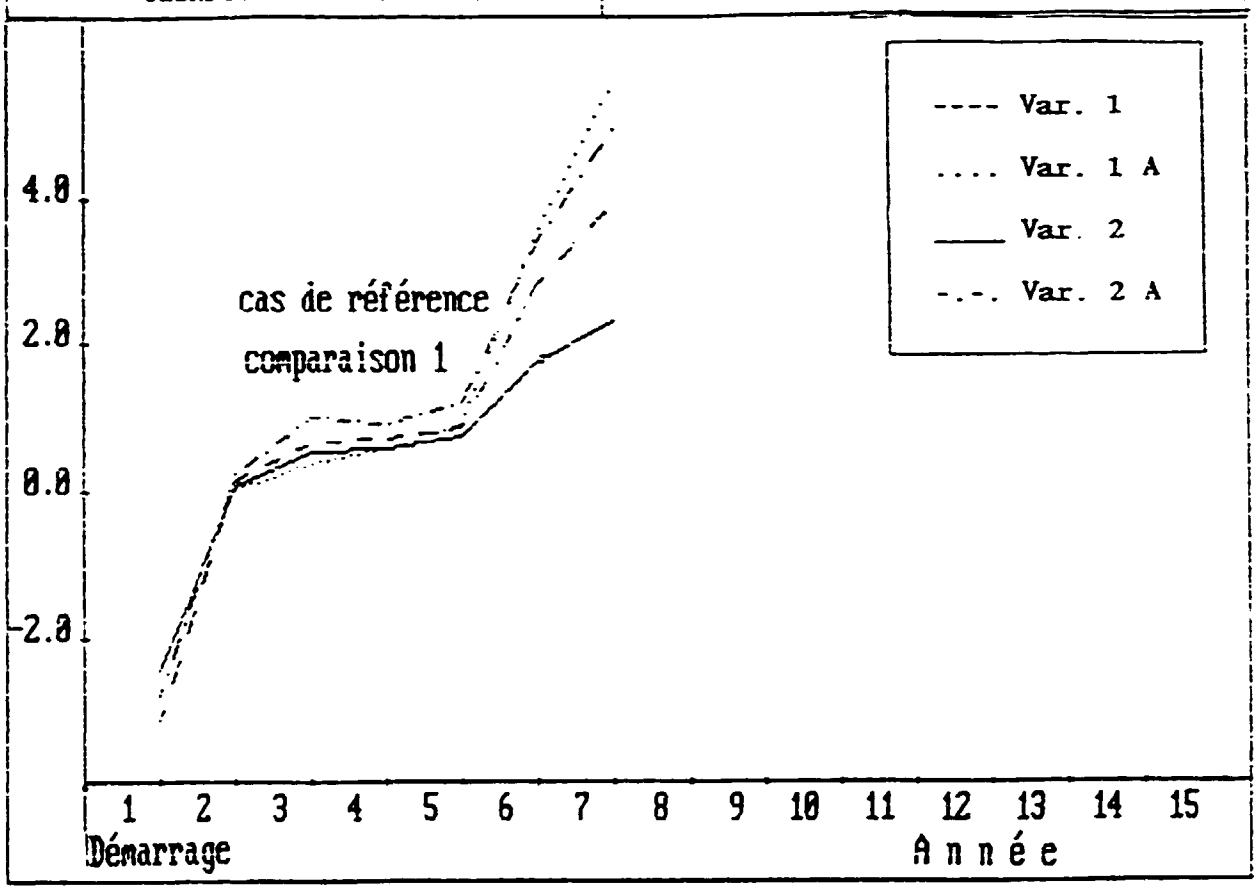


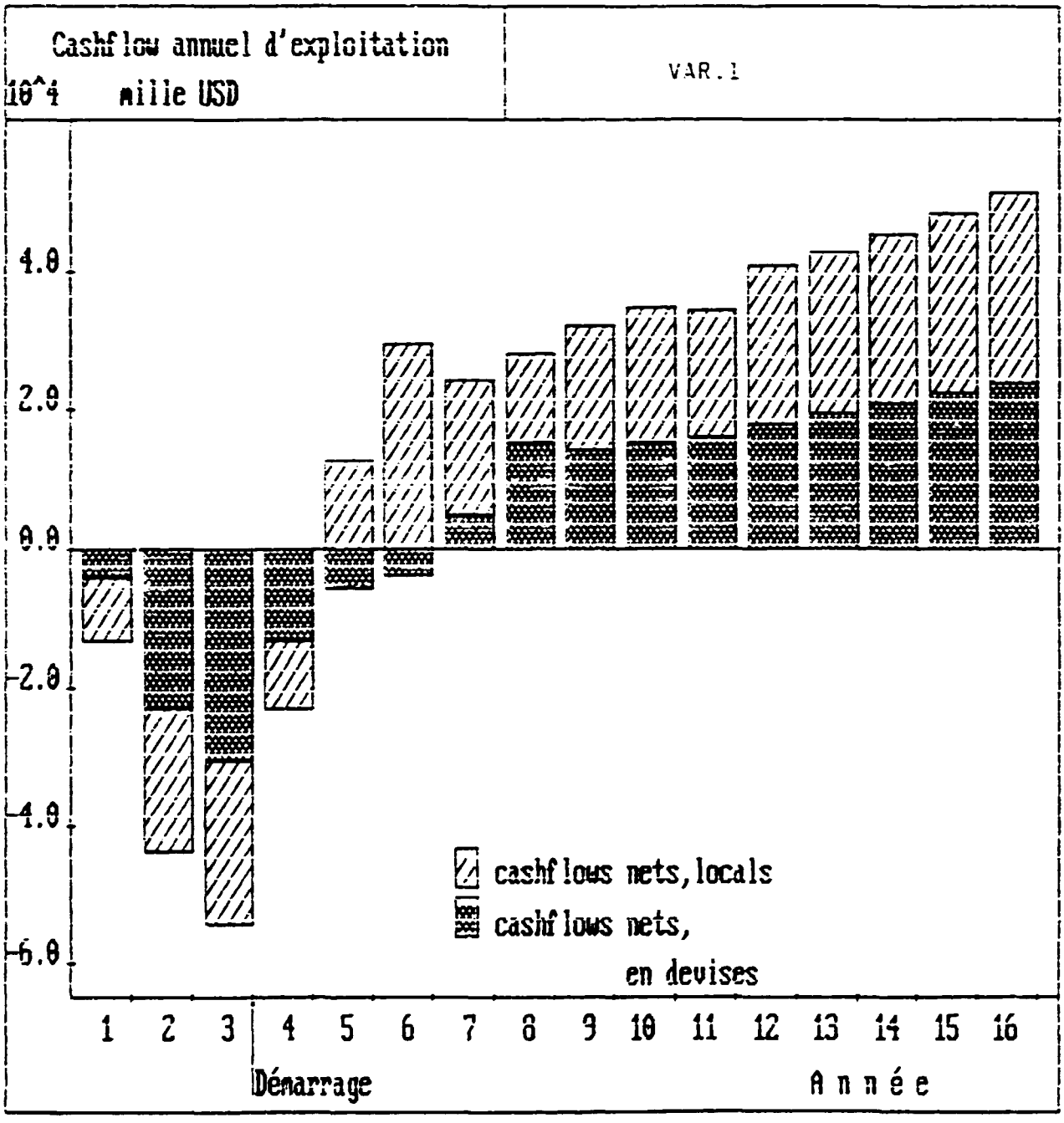
Bénéfice net / total des ventes Ratio en (%)	Graphe de comparaison

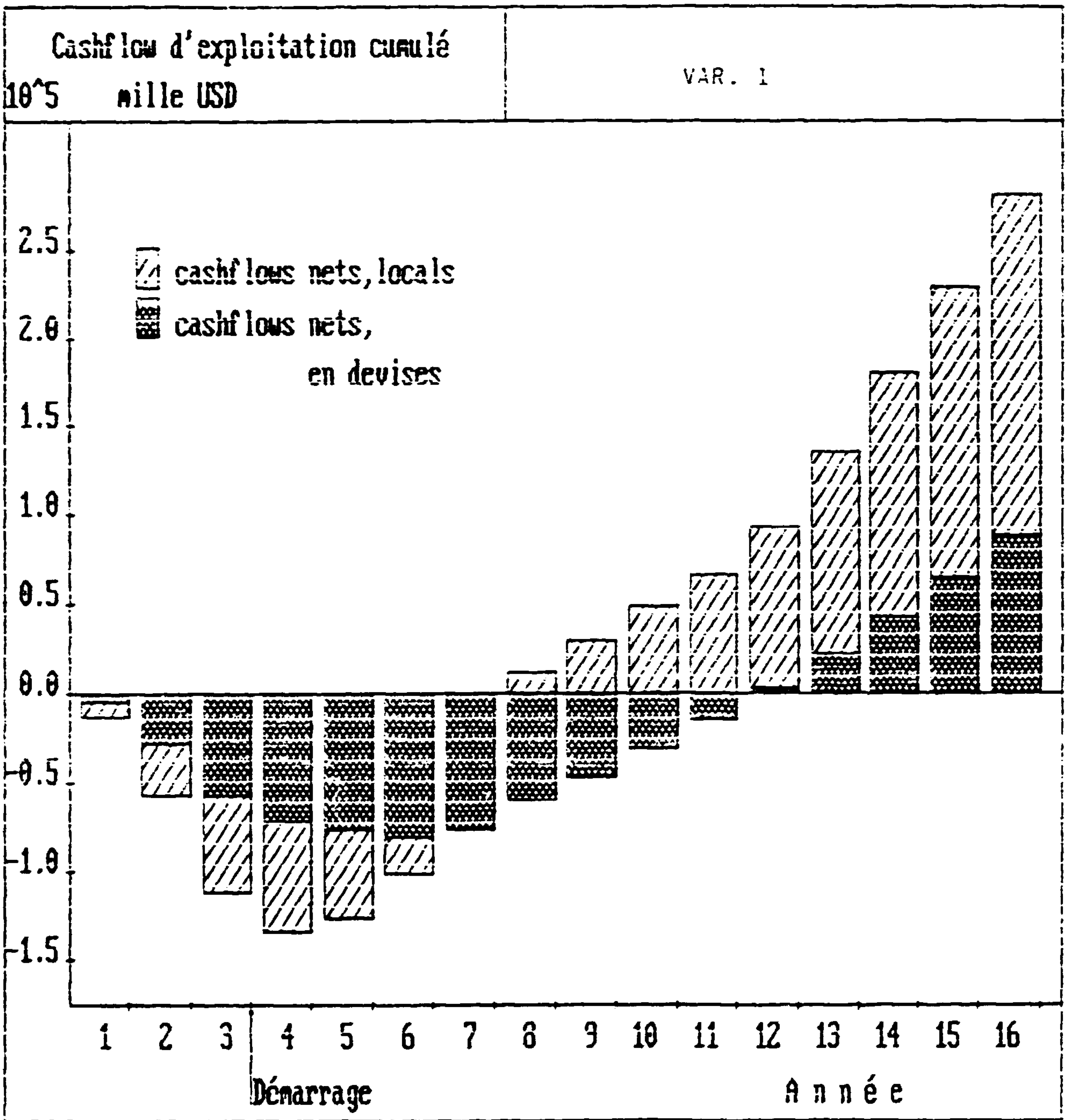


Coef. service de la dette par an
Cashflow net/service dette

Graphe de comparaison

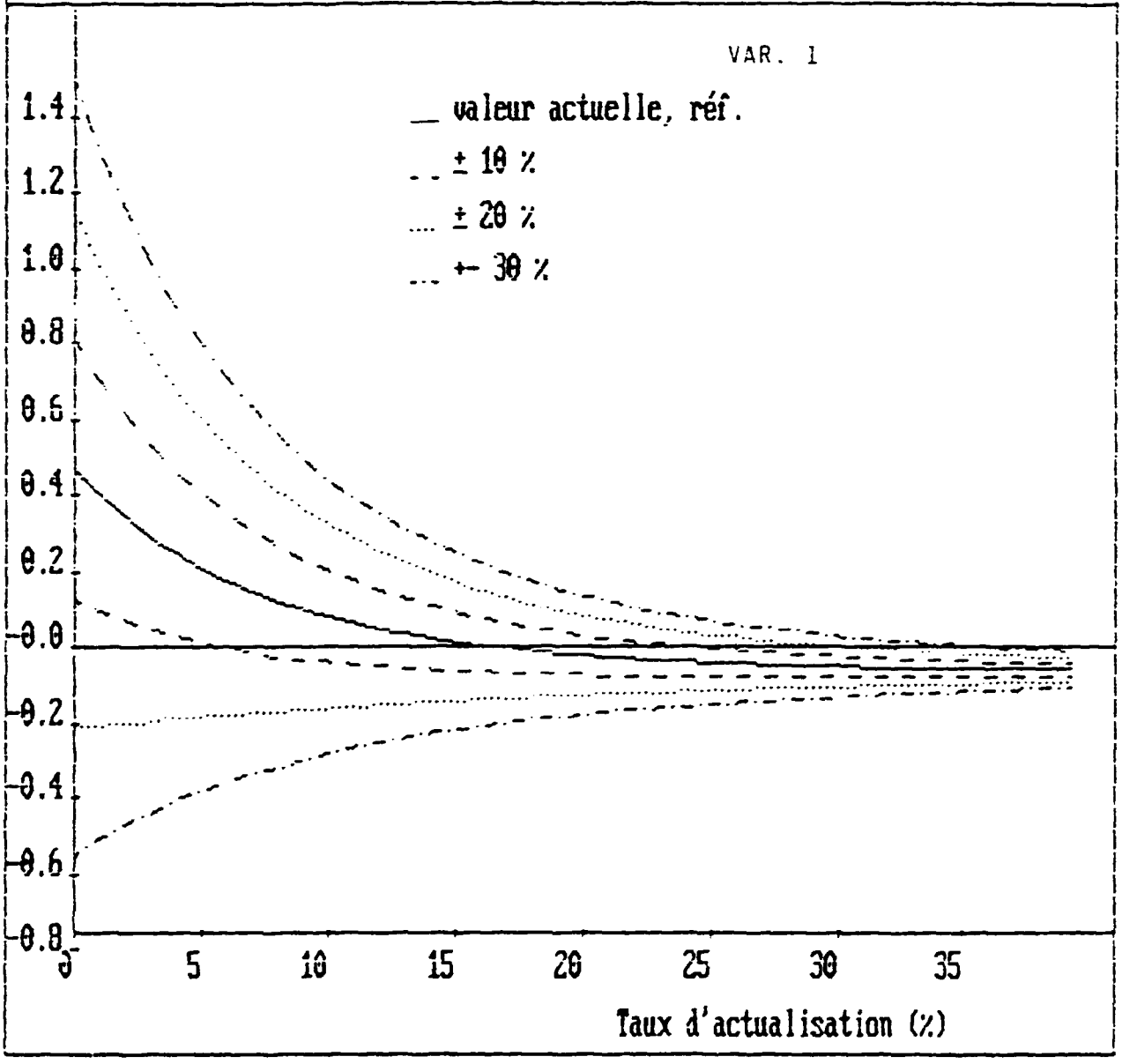


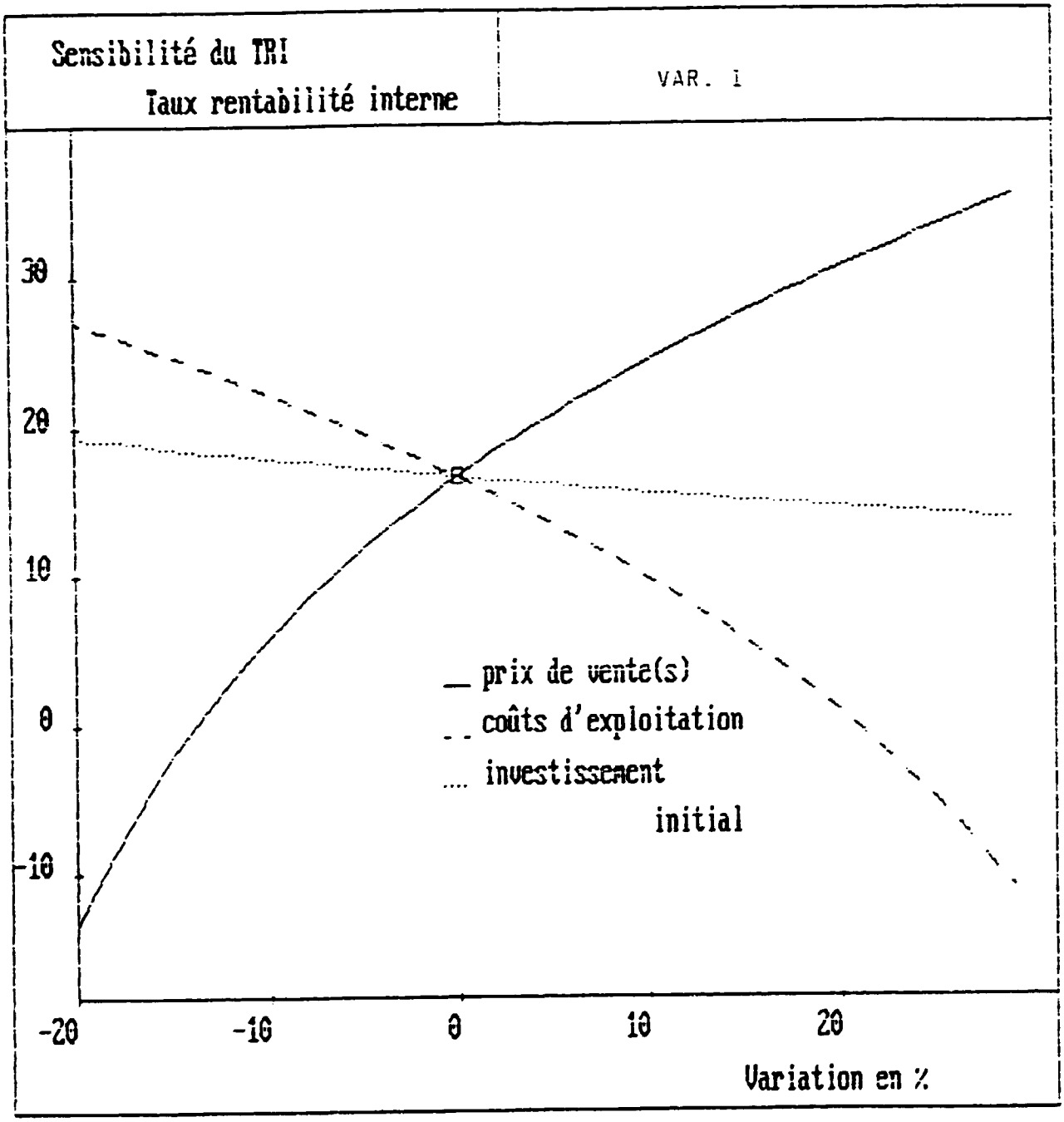

Cashflow annuel d'exploitation
10^4 mille USD
VAR.1
4.0
2.0
0.0
-2.0
-4.0
-6.0
cashflows nets, locals
cashflows nets,
en devises
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Démarrage
Année


Cashflow d'exploitation cumulé
10^5 mille USD
VAR. I
cashflows nets, locals
cashflows nets, en devises
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Démarrage
Année

Cashflow net actualisé
10^6 million us dollar

Variation des prix de ventes

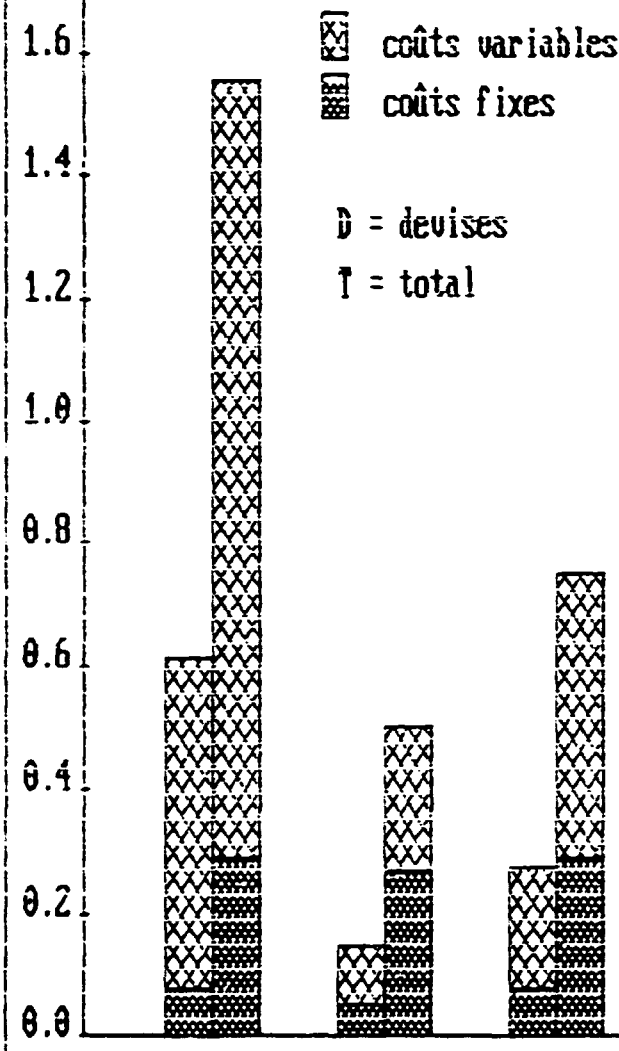



Sensibilité du TRI
Taux rentabilité interne
VAR. 1
30
20
10
0
-10
-20
-10
0
10
20
Variation en %
prix de vente(s)
coûts d'exploitation
investissement initial

Structure, coûts de production

Nominal = 5ème année de production

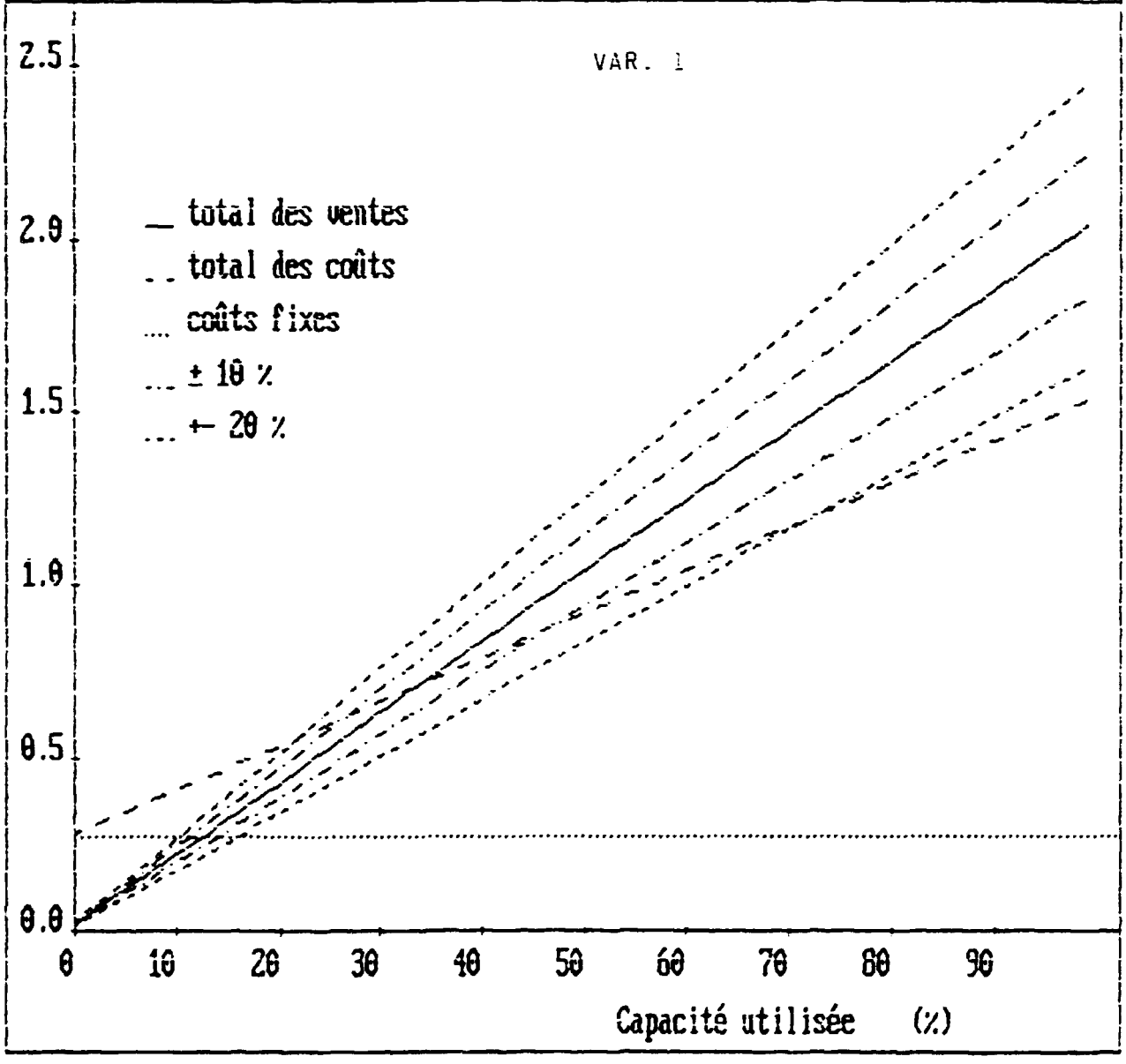
10^5 mille USD



Nominal	Démarrage	
71.43	39.91	matière pre.
6.77	4.60	autres MP
3.60	4.17	service pub.
0.14	0.20	énergie
0.95	3.31	main d'oeuv.
1.13	2.43	maintenance
0.59	0.64	pièces rech.
7.32	17.49	frais génér.
4.37	12.51	amortissem.
3.61	14.75	intérêt
100.00	100.00	Total C.Prod.

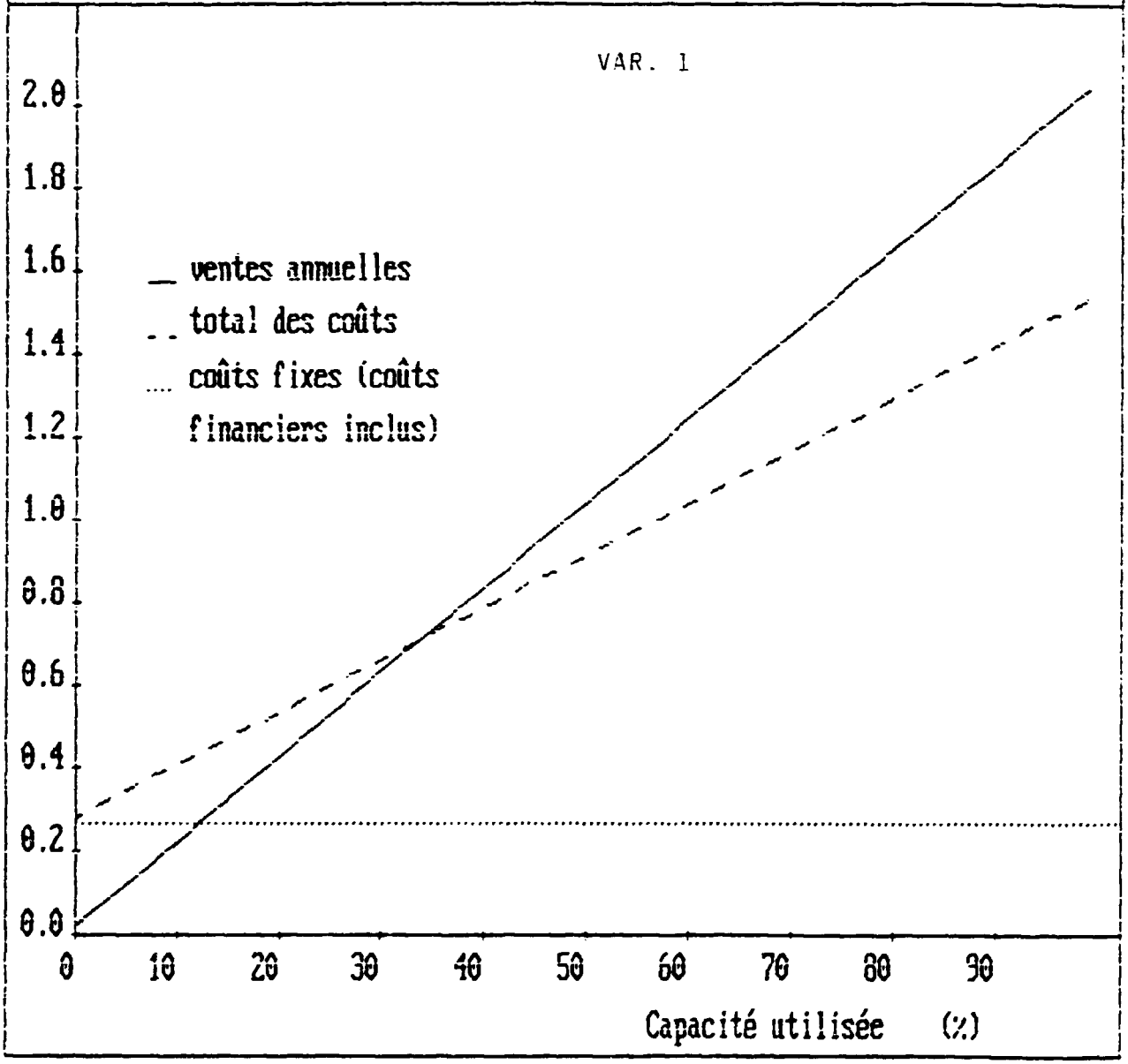
VAR. 1

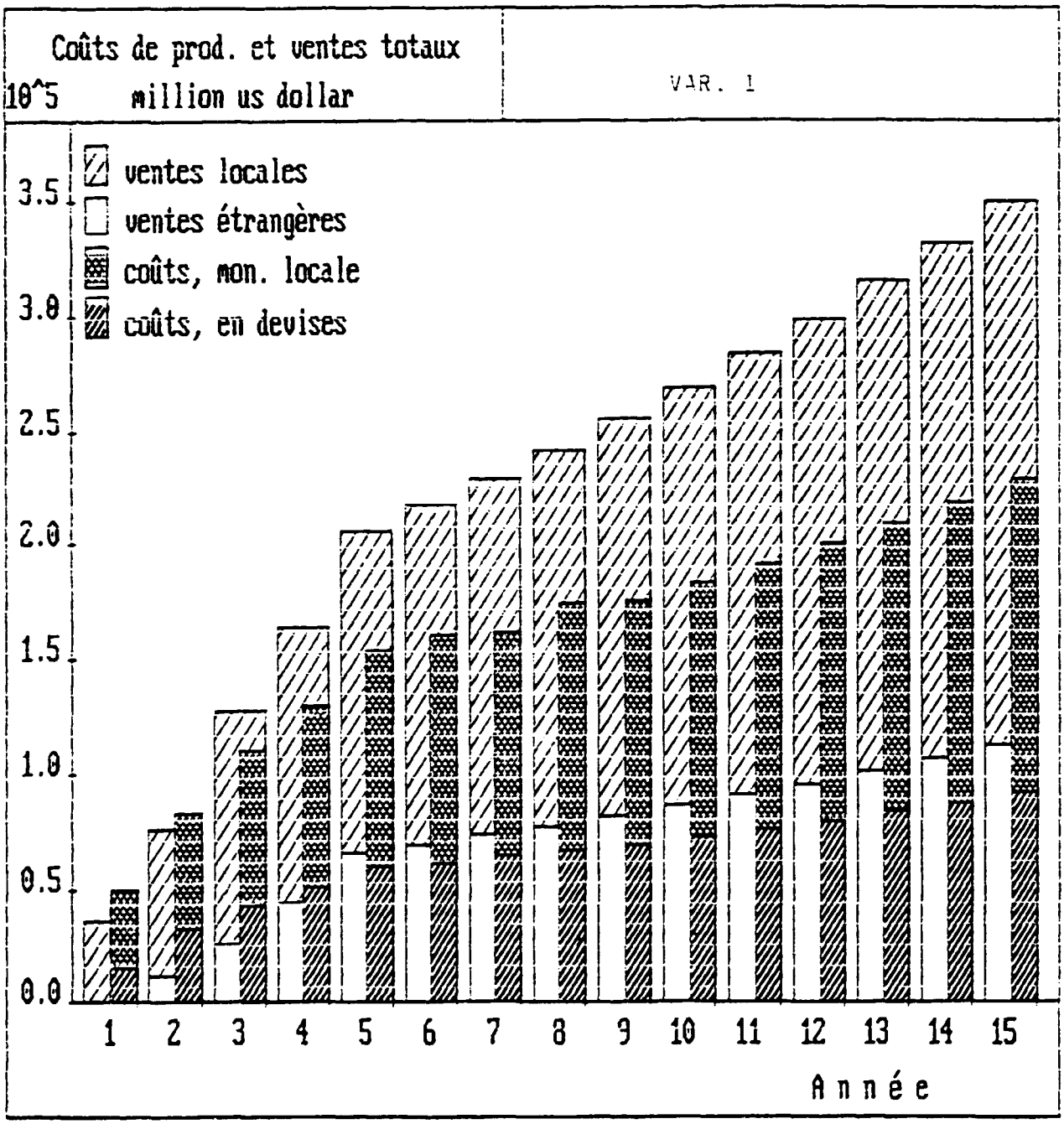
Seuil de rentabilité	Variation des prix de ventes
10^5 million us dollar	5e année de production



Seuil de rentabilité
10^5 million us dollar

5e année de production,
coûts financiers inclus





1.9. CONCLUSION

La présente etude préliminaire de faisabilité démontre que l'idée de l'efficacité de la production des véhicules directement dans la région avec le maximum de composantes pour le produit final produites sur place est correcte. Le marché des véhicules routiers dans la région est loin d'être saturé dans tous les domaines.

Le problème du marché non saturé est cependant lié à celui du niveau des systèmes économiques et sociaux des pays dans la région considérée. Les volumes du PNB ainsi que d'autres indices spécifiques sont de très bas niveau par rapport aux pays atteignant au moins le niveau économique moyen.

La situation politique dans la région n'est pas stable. Par conséquent le seul facteur stable est probablement la tendance de la croissance du nombre d'habitants. En Ethiopie l'accroissement de la population est en moyenne de 3.1% par an. A notre avis ce facteur va influencer de façon positive l'augmentation de la demande sur le marché des camions dans la région. Toute autre solution qui viserait le développement du marché des voitures de tourisme nous semble inutile dans cette situation, les voitures de tourisme étant incapables de résoudre le problème fondamental du transport de marchandises. C'est la raison pour laquelle nous nous sommes concentrés, du point de vue de marketing, au marché des camions uniquement à cause et notamment des camions légers dont la charge utile ne dépasse pas 10 tonnes. Ce groupe de véhicules sera le plus demandé dans le proche avenir. A cause de la stabilité faible de cette donnée deux alternatives de la demande future ont été considérées - une pessimiste et une

optimiste. La quantité de marchandises transportees et la capacite de transport ont ete prises pour variables.

La variante considérant la production de pièces de rechange pour voitures utilisees se heurte au problème fondamental d'un programme spécifique de production et celui de la quantité de diverses pièces de rechange à produire. Cela est dû au fait que la diversité des véhicules utilisées dans la région considerée de l'Afrique de l'Est est tres large à cause des importations différentes et le nombre de chaque type est relativement petit.

La variante de la production de composants choisis pour tiers n'est pas réaliste non plus à cause de la non-existence d'autres producteurs finaux de voitures routières dans la région.

Pour cette raison, la variante qui prevoit la production de pièces de rechange pour voitures utilisees ainsi que celle de la production de composants pour tiers ont ete abandonnées considérant leur non-faisabilité.

Etant donné la demande élevée des importations de composants pour l'assemblage final de voitures routieres et vu la mauvaise expérience concernant l'approvisionnement du marché régional en voitures completees à partir des pièces detachées importees, seule la variante prevoyant la production de voitures avec le maximum de composants produits sur place a été soumise à une analyse détaillée.

La demande de ces camions légers qui en résulte ne pourra naturellement pas être satisfaite uniquement par le producteur local futur, au contraire, on peut s'attendre aux opérations plus

actives de la part des autres participants au marché, notamment des importateurs.

Pour ces raisons la capacité de production de l'usine AKAKI a été déterminée, les possibilités techniques réalistes prises en considération, dans les variantes allant de 1500 exemplaires jusqu'à 5000 camions produits par an ce qui correspond approximativement à 30% jusqu'à 50% de la demande du marché régional.

L'analyse économique nous permet de recommander la Variante 1 pour une analyse technique et économique détaillée, en tenant compte du caractère controversé de la possibilité de mettre en oeuvre une opération de roulement de deux équipes par jour dans la région considérée.

Dans le futur, la variante permet toujours de faire augmenter la production annuelle à 5000 camions légers en intensifiant l'utilisation des installations de production de l'entreprise par roulement de deux équipes.

Pour conclure, les faits suivants sont à retenir:
- la demande des camions sur le marché dépend du développement de la situation économique dans la région;
- la stabilité politique détermine la tendance du développement de la situation économique dans la region;
- la croissance du nombre d'habitants prévue peut se solder par la nécessité d'augmenter le volume des marchandises transportées et donc également le nombre de camions;
- une augmentation générale du niveau de l'infrastructure dans la région fait partie intégrante de l'augmentation du nombre de véhicules routiers;

- le grand besoin d'importations ajouté au petit volume

d'exportations se solde par un manque chronique de monnaie convertible;
- les consommateurs potentiels - usagers des camions sont surtout les institutions dont l'Etat est le proprietaire;
- on peut s'attendre à la création progressive des conditions économiques de marché dans la region considérée;
- le prix d'un camion en Ethiopie varie de US$ 75 000 à 120 000;
- la restructuration de l'usine de production de pièces detachées et d'outils AKAKI en Ethiopie pour la production de camions est faisable tant sur la plan commercial, que technique ou financier;
- les effets du système de production proposé exerces sur l'environnement sont minimes;
- la restructuration de l'usine d'AKAKI créerait de nouveaux emplois (environ 600 - 1,200 employés suivant la variante du projet retenue);
- le taux de production des composantes du produit final - le camion - sur place a AKAKI est environ 50%.

Les risques et incertitudes peuvent être resumés de façon suivante:
- stabilité politique de la région;
- financement du projet;
- volume de la demande sur le marché futur;
- milieu économique en Ethiopie;
- approvisionnement de l'usine AKAKI en matieres et matériel;
- coopération des sous-traitants locaux à la production.

Démarches recommandées

Sur la base des faits et de l'analyses ci-dessus il est possible de recommander les démarches suivantes à entreprendre:

1. Informer les autorités éthiopiennes compétentes des observations et résultats de la présente étude et discuter avec eux l'aboutissement des futures conditions d'investissement étranger, étant donné que les réglementations et législation actuelles n'offrent pas de garantie efficace à l'afflux du capital étranger.
2. Prendre une décision au sujet du choix de la variante à réaliser.

3. Elaborer une étude de faisabilité ou de réalisation de la variante retenue.

4. Contacter les investisseurs potentiels qui pourraient être intéressés par la réalisation du projet, notamment les producteurs renommés de l'équipement de transport routier ainsi que les banques spécialisées.

20706 (2 of 4)

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

FINAL REPORT

Project No. DU/RAF/89/850

REGIONAL DEVELOPMENT OF AN EXISTING PLANT FOR MANUFACTURE OF TRANSPORT MEANS AKAKI, ETHIOPIA

INVESTMENT PROPOSAL

ELABORATED BY UNIDO
FOR THE ECONOMIC COMMISSION
FOR AFRICA FOR AFRICAN GOVERNMENTS

POLYTECHNA, Co.
Prague, Czech Republic

PROJEKTA Ltd.
Prague, Czech Republic

November 1993

CONTENTS

SUMMARY

Within the scope of transport systems development in African countries the Ethiopian ASPF plant was selected by a group of UN experts (see study No. DU/RAF/89/850) as a feasible base for securing the road transport development in the East African region.

This plant was put into operation in 1989 and is furnished with a solid base of machinery and equipment. Production programme consists mainly of custom - made spare parts for different types of machinery and hand tools. The marketing research was oriented at two main directions of the business plan for ASPF revitalization.

The first direction was oriented at the production of a selected type of road vehicle, the second at the production of certain components or spare parts for road motor vehicles.

For the alternative of implementing the strategy of the production of a selected type of vehicle the main aims were the following :

- establishing of own production of road vehicles suitable for the African region, utilizing local sources of labour, raw materials and production capacities
- providing economically priced road vehicles for the unsaturated market
- providing partially spare parts for the manufactured vehicles

The second alternative oriented at spare parts production was led by the effort to provide the market with spare parts for utilized vehicles which at present are generally in short supply.

On the basis of the above mentioned assumptions several variants of the ASPF plant restructuring were studied :

- assembly of road vehicles
- manufacture of road vehicles with a maximum share of components production
- manufacture of road vehicles components for another final producer
- manufacture of spare parts for utilized vehicles

The variant of spare parts manufacture for utilized vehicles leads to the basic problem of a specific production programme and of the quantity of individual produced spare parts. This is caused by the fact that the range of utilized vehicles in the East African region is very wide due to different imports and at the same time the numbers of individual types are relatively low.

The variant of manufacture of selected components for another is also not realistic due to the nonexistence of another final producer of road vehicles in the region.

For this reason both the variants of spare parts manufacture for utilized vehicles and of components manufacture for another final producer were abandoned due to their technical and economical non-feasibility.

Due to high demands for imports of components for road vehicles final assembly and to bad experience with providing the regional market with road vehicles completed from imported parts only the variant of vehicles manufacture with a maximum share of components production was subjected to a detailed analysis. This variant allows for satisfactory saturation of the demand for road vehicles on the market, minimization of costs and utilization of local production capacities and labour.

The pre-feasibility study contains the following four variants of road vehicles production in the revitalized ASPF plant :

VARIANT 1 - production of 3000 trucks annually in a single-shift working mode.
VARIANT 1A - production of 5000 trucks annually in a two-shift working mode.
VARIANT 2 - production of 1500 trucks annually in a single-shift working mode.
VARIANT 2A - production of 3000 trucks annually in a two-shift working mode.

Based on the economic and financial analysis Variant 1 was found to be the most suitable both from the technical and from the economic point of view. Its main characteristics are following:

nominal production	3.000 pcs
Total investment costs	122 mil. USD
NPV	55,1 mil. USD
IRR	16,6 %
Payback period	6 years

Further implementation of the project is dependent on the discussion of its features and conditions with representatives of the Ethiopian government, on finding a suitable investor and on the elaboration of a feasibility or engineering study of the chosen variant.

Key words:

East African region
AKAKI Spare Parts and Hand Tools Factory
Road transport equipment
Privatization
Restructuring of production
Regional integration

List of Used Abbreviations, Symbols and Units

PCP	- Passenger Car Privata
PCO	- Passenger Car Others
BU	- Bus
TRL	- Truck under 10 t
TRH	- Truck over 10 t
TNK	- Tanker
TL	- Trailer
MC	- Motorcycle
t	- Metric Ton
t/km	- Metric Ton-Kilometre
kV	- Kilo Watt
MV	- Mega Watt
MVh	- Mega Watt Hour
h	- Hour
l	- Litre
m^2	- Metre Square
m^3	- Metre Cubic
kg	- Kilogram
1 Birr	- 0.2 USD (US$)
ASPF	- AKAKI SPARE PARTS AND HAND TOOLS FACTORY
1 ETB	- 1 Birr
NPV	- Net Present Value
IRR	- Internal rate of return
CF	- Cash Flow
DCF	- Discounted Cash Flow

1.1 PROJECT BACKGROUND AND HISTORY

This pre - feasibility study of the market with road transport equipment in the region of East Africa and restructuring of AKAKI Spare Parts and Hand Tools Factory, Ethiopia, is a part of an umrella project No. DU/RAF/89/850 on the development of transport equipment products in the four regions of Africa (Vest, Central, East and South). The study was preceded by a diagnostic survey in individual countries of the regions and of the situation in some individual plants. Based on the recommendations of a steering committee where ECA, UNDP, UNIDO, EPDF, OAU and various governments were represented the entire project was segmented into two groups of existing plants in the four African regions which could, if improved, contribute to the industrial and regional integration of each subregion.

For the needs of possible future production of road transport equipment, AKAKI Spare Parts and Hand Tools Factory in Ethiopia has been identified. This plant has been put into operation in 1989 and has not acquired its nominal production due to sales problems.
Possible production of a selected group of vehicles and spare parts is to be realized at the domestic market and at the markets of other countries of the region.

The task of this study thus is now verify the market with road vehicles in the region, to determine the market demand, to select a suitable type of vehicle to be produced in AKAKI, to design the restructuring of the production of transport equipment or complete vehicles and to verifly the financial and economic effectivity of the designed future regional plant.

Both politically and economically Ethiopia is now in a transitional period which should end by new elections, planned for January 1994. It remains to be seen what economic policy the

new government will adopt to reach the proclaimed target of privatization and free market economy. The analysis shows, however, that without some form of privatization of the AKAKI plant the effective restructuring of its production would be very problematic. It also shows that solely by upgrading the existing production of parts and components no effective contribution to the issue of road transport development can be reached due to a wide range of utilized road vehicles and therefore to the impossibility of installing effective batch production of parts. For this reason the study recommends a package strategy of manufacturing and marketing a selected type of vehicle.

1.2. GENERAL INDICATORS

The market with motor vehicles in the Eastern region of Africa is very lightly developed, especially in the segment of trucks where the rate achieves 0.15 vehicle per thousand inhabitants. One assembly plant - FIAT/IVECO whose inputs are almost completely imported with capacity of approximately 2,500 trucks annually is situated in the region, however, its actual production is about 200 (1990) up to 500 (1991) vehicles. The reason is a chronical lack of convertible funds in the country for purchases of components for assembly.

No organized market of distributors exists, imports of vehicles are realized individually and in a disorganized manner.

Neither a service network is created, with the exception of several trade-mark service centers for passenger cars.

The main road transporter is Ethiopian Freight Transport Corporation - a state-owned company, which realizes about 85% of the total freight transport in the country. The remaining part is realized by small, also private forwarders.

Prices of trucks at the market ranges from US$ 75 000 up to

120 000.

The future market demand is directly proportional to:
- the level of development of the national economic system;
- the volume of transported goods;
- the growth in the number of inhabitants;
- the level of development of the infrastructure in the region;
- the purchase power of potential buyers;
- political stability.

With the optimistic variant of development, the following market demand for trucks in Ethiopia can be approximately expected:

YEAR	1992	1995	1998	2000	2005
number of trucks in pieces	2191	3500	5800	8500	10200

With the pessimistic alternative, the maximal annual demand for trucks will probably reach the following levels:

YEAR	1992	1995	1998	2000	2005
number of trucks in pieces	2191	2400	3000	3900	6300

The difference between both alternatives reflects the uncertainty of the future economic development in the region in all its aspects and the ensuing development of its purchasing power.

1.3. MARKETING CONCEPT

From the entire mixture of the market demand for individual groups of road vehicles, the highest demand is for trucks with loading capacity up to 10 tons. Production of these vehicles is technically and commercially feasible under certain conditions in AKAKI Spare Parts and Hand Tools Factory, Ethiopia, which has been selected during previous researches as a suitable plant for possible production of vehicles or spare parts.

The total number of required vehicles with loading capacity up to 10 tons at the Ethiopian market can be estimated as follows (in both the optimistic and pessimistic alternatives):

		1992	1997	2000	2005
number of trucks (pc)	optimistic	1527	2500	6000	9500
	pessimistic	1527	2000	2700	4500

Totally, the following way of realizing the required trucks is thus assumed:

Vehicle Type	Satisfying the Demand by:
Trucks with loading capacity over 10 t	imports
Trucks with loading capacity up to 10 t	30 - 50 % production in AKAKI 50 - 70 % imports

Passenger cars will only be imported into the region.

Within production of vehicles in the AKAKI plant, different modifications (towing vehicles, dump trucks, tractors, etc.) are expected to be produced in addition to the basic model - flat truck.

The orientation price of the final product - truck, is US$ 60,850. This price respects both estimated production costs and the necessity of competitiveness on the region's market.

The above mentioned facts are used as a basis for the variants of designed reconstruction of AKAKI to production of trucks.

The particular production implementation curves are as follows:

VARIANT 1 - production of 3000 trucks in a single-shift working mode.

year	1	2	3	4	5
number of cars	600	1300	2050	2500	3000

VARIANT 1A - production of 5000 trucks in a two-shift working mode.

year	1	2	3	4	5
number of cars	660	1300	2100	2800	3900

VARIANT 2 - production of 1500 trucks in a single-shift working mode.

year	1	2	3	4
number of cars	330	900	1200	1500

VARIANT 2A - production of 3000 trucks in a two-shift working mode.

year	1	2	3	4	5	6
number of cars	660	1250	2050	2500	2900	3000

Capacity of the plant is limited by the capacity of the existing mechanical machining shop. The ratio of own production of components for the final product in AKAKI is about 50%.

1.4. RAW MATERIAL INPUTS AND FACTORY SUPPLIES

The following volumes of materials will have to be provided for production:

Consumption of Major Materials (ton)

Material	Variant			
	1	1A	2	2A
Sub-supplies	12 790	25 281	6 895	13 700
including wheel disks	1 050	1 925	525	1 050
	21 000 pc	38 500	21 000 pc	
tyres	2 500	4 583	1 250	2 500
	21 000 pc	38 500	21 000 pc	
batteries	240	440	120	240
	6 000 pc	11 000 pc	3 000 pc	6 000 pc
electric installation material	105	192.5	52.5	105
Metallurgical material	8 900	16 317	4 450	8 900
including plates	5 500	10 083	2 750	5 500
profiles, tubes rods	3 400	6 233	1 700	3 400
cabin pressings	1 050	1 925	525	1 050
forgings	1 100	2 016	550	1 100
castings	1 300	2 383	650	1 300
upholstery	108	198	54	108
paints	390	715	195	390
oils, lubricators, etc.	300	550	150	300
combustible material	620	1 136	310	620
chemicals	200	366	100	200
overheads material	220	400	110	220
metal scrap	1 692	3 102	864	1 692
non-metal scrap	320	584	160	320

The sub-supplies for production are partially available in the region (tyres, rubber parts, batteries, starters, alternators, radiators, filters, exhausters, sheets, dampers, brake lining, leaf springs, etc.), a reduced part of components will have to be imported from selected producers (e.g. engines, pressings for cabins, axles, etc.).

1.5. LOCATION, SITE AND ENVIRONMENT

The selected plant for production of trucks - AKAKI Spare Parts and Hand Tools Factory, is situated about 25 km from the capital of Ethiopia at a main road connecting Addis Ababa with the port of Assak in the distance of about 850 km. There is also a railway line quite near the plant, in the direction Addis Ababa - Djibouti. Thus the position of the plant, regarding the transport of materials, is very advantageous.

The altitude is about 2000 m, day temperatures reach 20 up to 25°C.

The designed type of production can be considered to be ecologically friendly. Realization of effective devices limiting production of harmful substances is assumed. The project will create jobs for about 1100 workers.

1.6. ENGINEERING SITUATION AND TECHNOLOGY

The technological and technical design of the reconstruction of AKAKI is based on the assumption that the existing system of the mechanical machining shop will be maintained in its full range for production of vehicles. Therefore, this system is limiting for realistic designs. All existing facilities in the plant will be used for the new production system.
The new buildings include:

- body & assembly building;
- building for production of electric installation & upholstery workshop;
- repairs;
- transfer hall;
- central maintenance;
- store-house for tyres;
- store-house for fuel;
- compressor station;

- store-house for gases;
- store-house for waste.

The total floor area of these buildings is about 38 thousand square meters in the variant 1 and 27 thousand square meters in the variant 2.

The buildings are designed to maintain the logics of the technical flows during production.

The projected expansion of the plant will result in its increase by about 130,000 square meters. From the technical point of view, the system is based on the aim to ensure a significant ratio of own production components in the plant, in fact own production will be represented with 50% of the entire set of components forming the final product - truck. The concept considers complex mechanical machining, thermal treatment (foundry, hardening shop, forge), welding of body parts, varnishing and assembly. Own production also includes gearboxes.

The main imported sets are engine and axles. The power requirements of the plant are provided in a corresponding way. Vaste technical water is neutralized, emissions of harmful substances are minimized.

Both basic variants of the design (Variant 1 = 3,000 vehicles per year, Variant 2 = 1,500 vehicles per year) are considered for the single-shift utilization of the production machanical, and they are modified for the case of the two-shift utilization (Variant 1A = 5,000 vehicles per year, Variant 2A = 3,000 vehicles per year).

1.7. HUMAN RESOURCES

Vorkers of the future plant for production of vehicles will be trained abroad in selected professions (about 50 workers). Besides, supervision of about 30 specialists in the plant during the implementation of production is assumed.

The particular number of workers required for production of trucks in the individual sub-systems is as follows:

Number of Vorkers

The following numbers in the individual sub-systems of production of vehicles are assumed:

Section - Category	Number of Workers			
	VARIANT			
	1	1A	2	2A
Mechanical production	222	371	122	222
including production workmen	145	250	73	145
overheads workmen	63	100	33	63
Forge	20	39	10	20
Hardening shop	24	45	12	24
Foundry	40	70	20	40
Body & Assembly production	552	968	283	552
including production workmen	356	648	178	356
overheads workmen	151	257	79	151
Upholstery & el. installation	40	67	20	40
Central maintenance	24	43	12	24
Store-house for sub-supplies, oils, combustible matters, waste & gases	40	70	20	40
Tyres and batteries	9	15	5	9
Other	129	212	65	129
TOTAL	1100	1900	569	1100
including production workmen	595	1078	298	595
overheads workmen	357	612	197	357
technical & admin. workers	148	210	74	148

1.8. FINANCIAL ANALYSIS

The proposed variants provide following results in the financial analysis.

	Variant			
	1	1A	2	2A
Total investment (thousand US$)	122,000	125,600	80,400	83,480
Net present Value (thousand US$)	55,123.2	111,555	4,531.7	83,110.5
Internal rate of return (%)	16.6	19.3	12.22	21.39
Pay back period (years)	6	6	9	5

Calculated discount rate: 11,5 %

The analysis has logically proved the profitability of the variants considering the two-shift utilization of the production machinery (1A, 2A).

Because of probable problems with organizing a two-shift working mode in the given region, however, these variants can be considered to be prospective only in the longer future.

Therefore, the financially most profitable variant under these conditions is the Variant 1, i.e. production of 3000 pieces of trucks annually in the single-shift working mode.
In the case of favourable circumstances, this variant makes it possible to smoothly pass over to production of 5000 trucks per year in the two-shift operation.

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.1

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111090.00	51.931 % foreign
current assets:	450.00	100.000 % foreign
total assets:	111540.00	52.125 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	69000.00	
local loans :	53000.00	
total funds :	122000.00	56.557 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	36316.10	142953.00	177675.80
depreciation :	6293.14	6788.59	6788.59
interest :	7420.00	5607.50	0.00
production costs	50029.24	154449.10	184464.39
thereof foreign	29.48 %	39.13 %	39.53 %
total sales :	40161.00	229603.00	293038.00
gross income :	-14608.24	50540.86	83722.25
net income :	-14608.24	22743.39	37675.01
cash balance :	-30296.55	-3751.97	42621.45
net cashflow :	-22876.55	27938.86	42621.45

Net Present Value at: 11.50 % = 55123.19
Internal Rate of Return: 16.60 %
Return on equity1: 61.37 %
Return on equity2: 20.98 %

Index of Schedules produced by COMFAR

Prodaction road vehicles AKAKI Ethiopia
June 1993
Developaent of ASPF Ethiopia - var.1A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111590.00	52.146 % foreign
current assets:	450.00	100.000 % foreign
total assets:	112040.00	52.338 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	70000.00	
local loans :	55600.00	
total funds :	125600.00	55.732 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	42951.34	184613.70	288133.10
depreciation :	6326.64	6984.59	6984.59
interest :	0.00	5817.30	0.00
production costs	49277.98	197415.30	295117.70
thereof foreign	29.81 %	38.28 %	39.54 %
total sales :	39897.00	294817.90	485526.80
gross income :	-14120.98	66245.19	149398.60
net income :	-14120.98	29810.34	67229.35
cash balance :	-33313.30	-3484.31	71223.34
net cashflow :	-33313.30	29099.34	71223.34

Net Present Value at: 11.50 % = 111555.00
Internal Rate of Return: 19.30 %
Return on equity1: 59.13 %
Return on equity2: 25.07 %

Index of Schedules produced by COMFAR

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	74460.00	42.479 % foreign
current assets:	350.00	100.000 % foreign
total assets:	74810.00	42.748 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	42000.00	
local loans :	38440.00	
total funds :	80440.00	52.213 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	20706.98	75747.76	94384.59
depreciation :	4082.06	4195.14	4195.14
interest :	5381.60	3845.80	0.00
production costs	30170.64	83788.70	98579.73
thereof foreign	26.69 %	37.67 %	38.09 %
total sales :	20080.50	113944.60	145425.30
gross income :	-12520.14	18096.74	34632.00
net income :	-12520.14	8143.53	15584.40
cash balance :	-18402.26	-5664.50	18816.39
net cashflow :	-13020.66	15087.96	18816.39

Net Present Value at: 11.50 % = 4531.70
Internal Rate of Return: 12.22 %
Return on equity1: 36.49 %
Return on equity2: 13.08 %

Index of Schedules produced by COMFAR

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2 A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	76300.00	43.145 % foreign
current assets:	350.00	100.000 % foreign
total assets:	76650.00	43.405 % foreign

Source of funds during construction phase

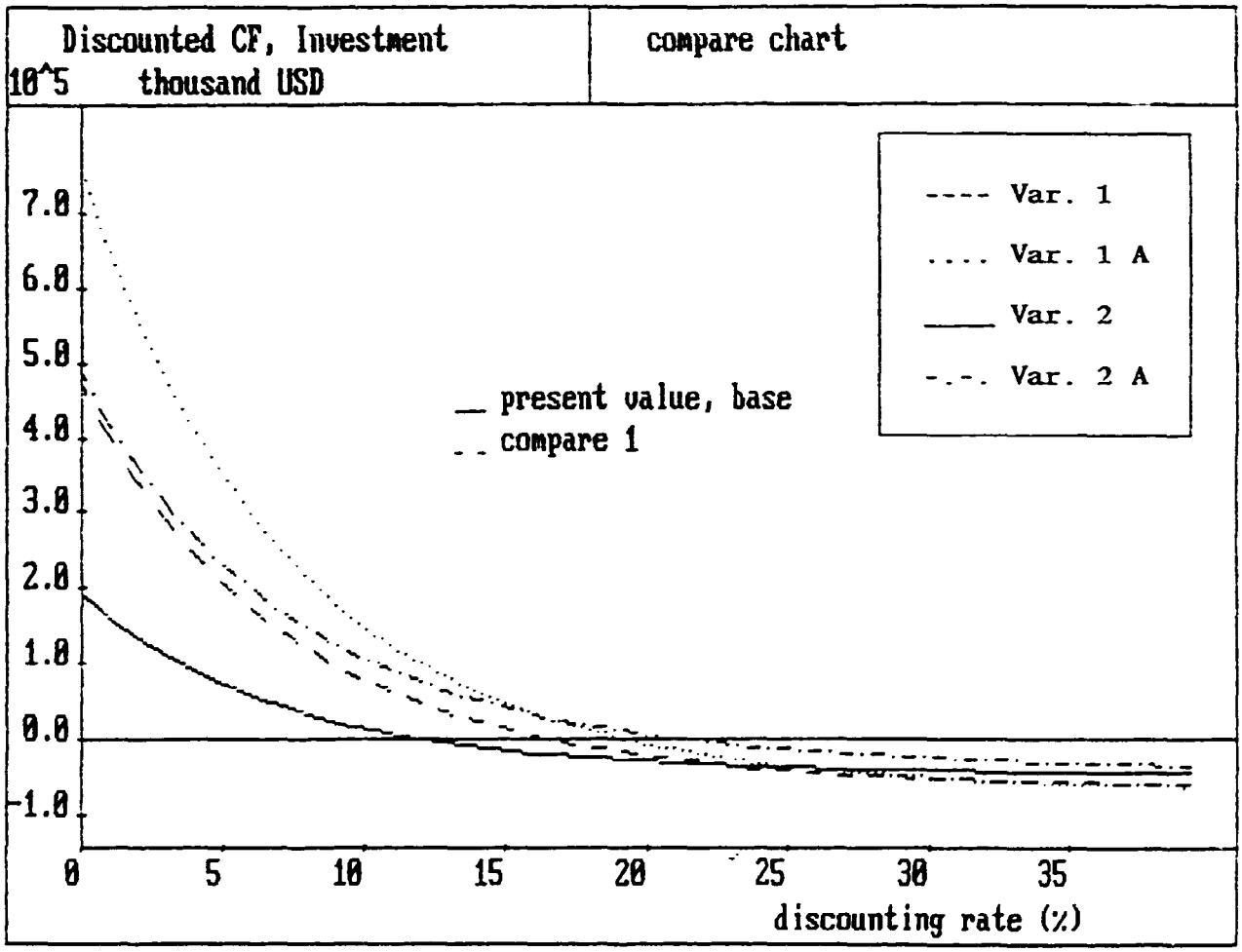
equity & grants:	0.00	0.000 % foreign
foreign loans :	43000.00	
local loans :	40480.00	
total funds :	83480.00	51.509 % foreign

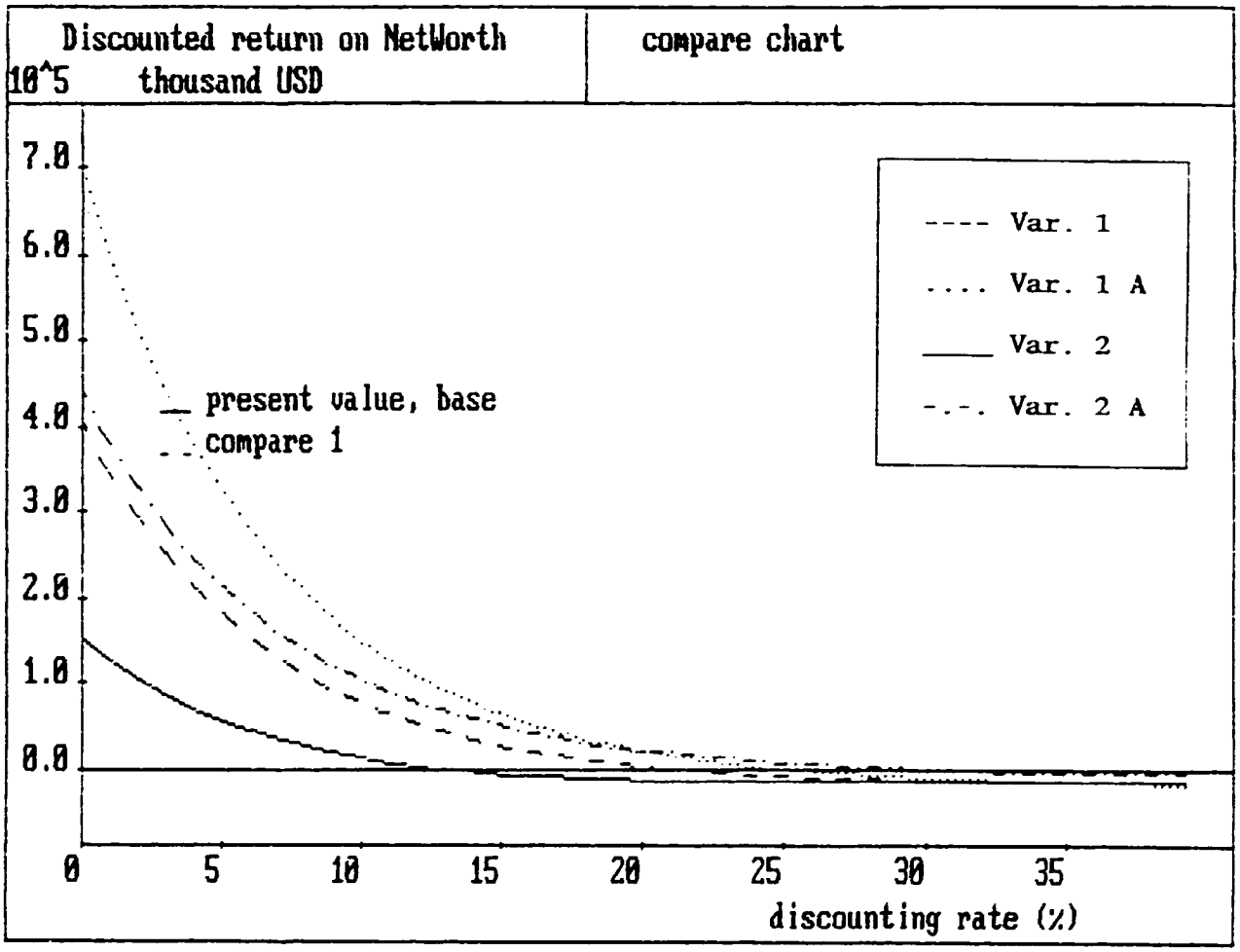
Cashflow from operations

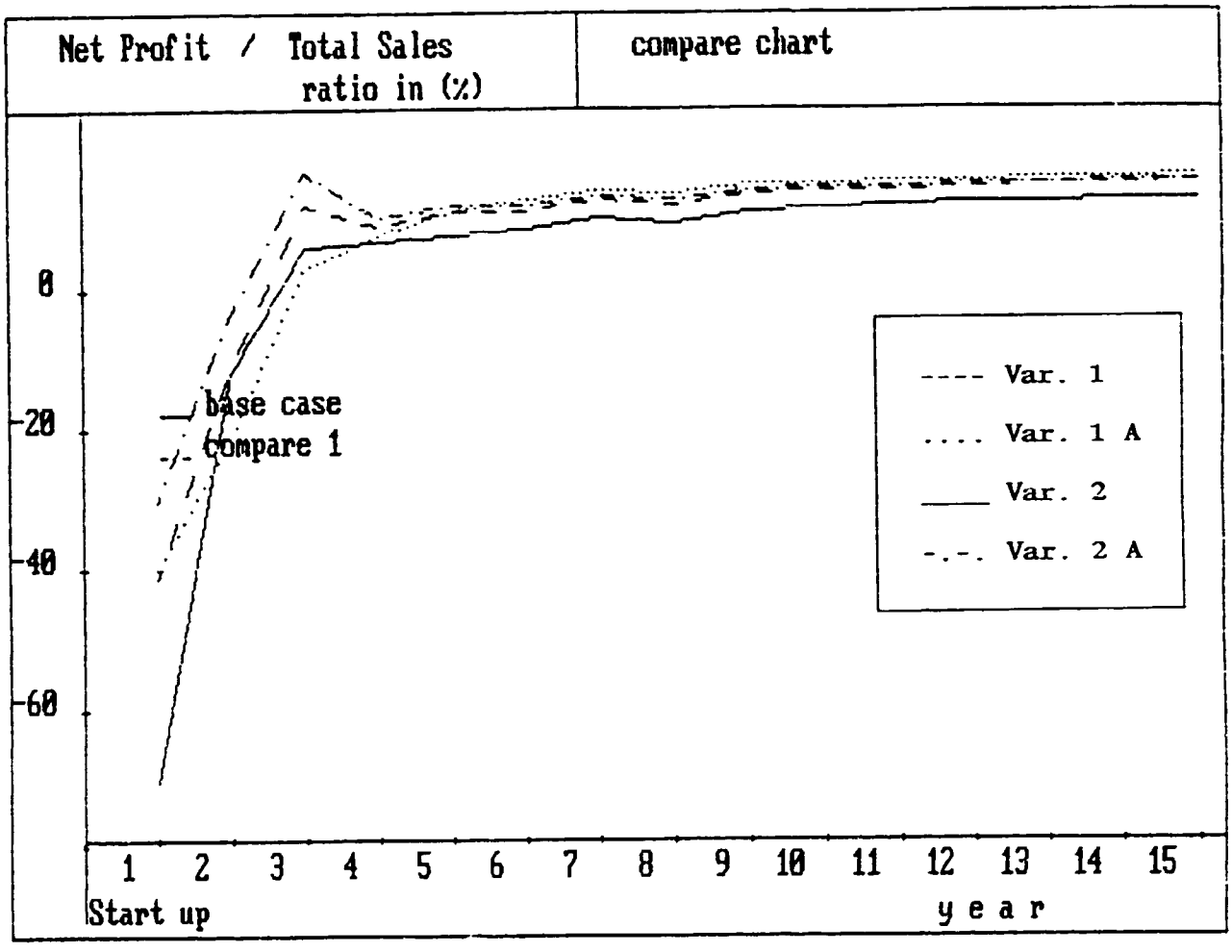
Year:	1	5	10
operating costs:	36316.10	137843.70	177675.90
depreciation :	4195.99	4379.27	4379.27
interest :	5667.20	4016.10	0.00
production costs	46179.29	146239.10	182055.00
thereof foreign	28.43 %	38.48 %	39.09 %
total sales :	40161.00	222206.70	293038.00
gross income :	-10758.29	53051.83	86131.56
net income :	-10758.29	23873.32	38759.20
cash balance :	-21263.75	4725.03	41296.33
net cashflow :	-15596.55	26237.80	41296.33

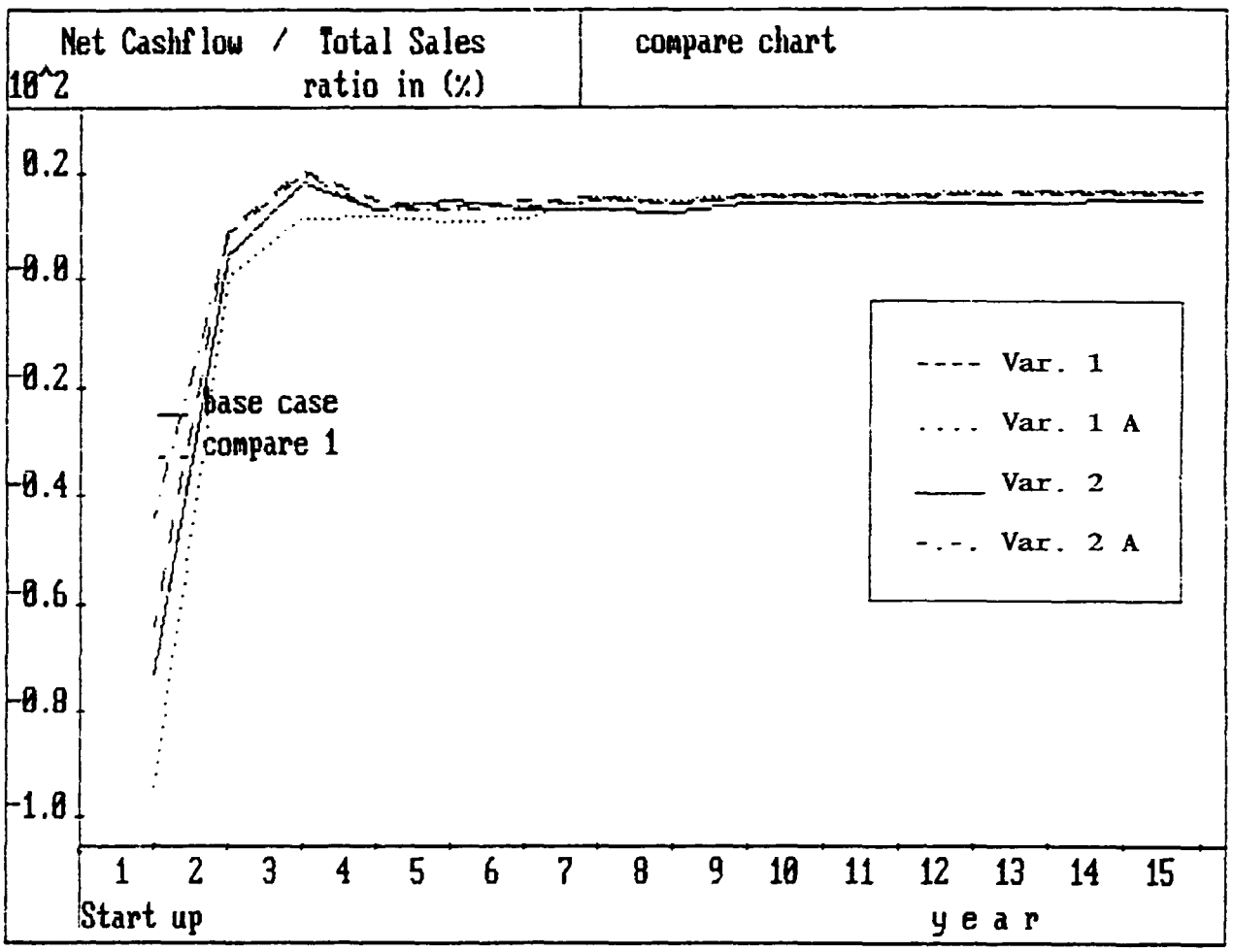
Net Present Value at: 11.50 % = 83110.48
Internal Rate of Return: 21.39 %
Return on equity1: 92.93 %
Return on equity2: 30.14 %

Index of Schedules produced by COMFAR

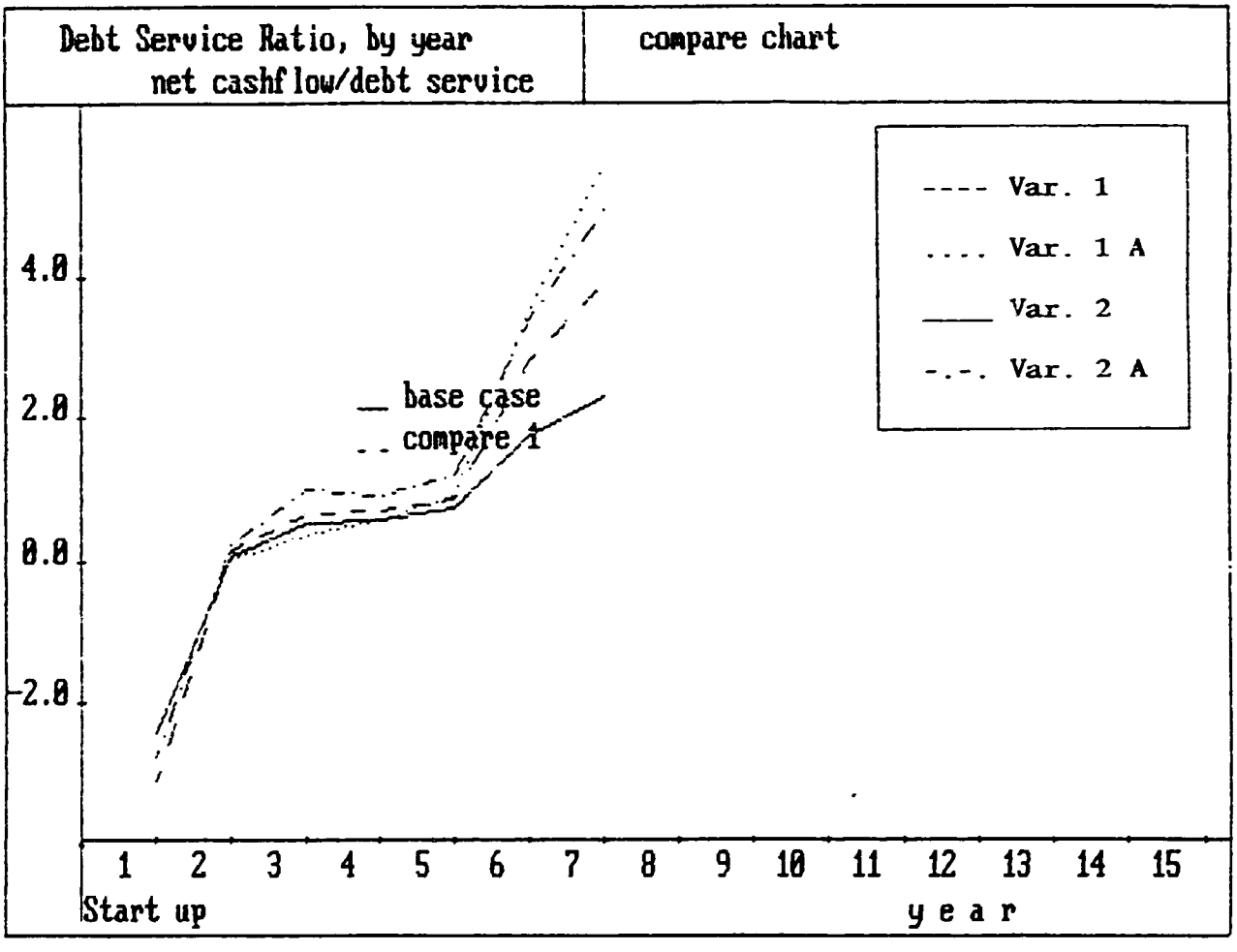

Discounted CF, Investment
compare chart
10^5 thousand USD
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
0
5
10
15
20
25
30
35
discounting rate (%)
present value, base
compare 1
Var. 1
Var. 1 A
Var. 2
Var. 2 A

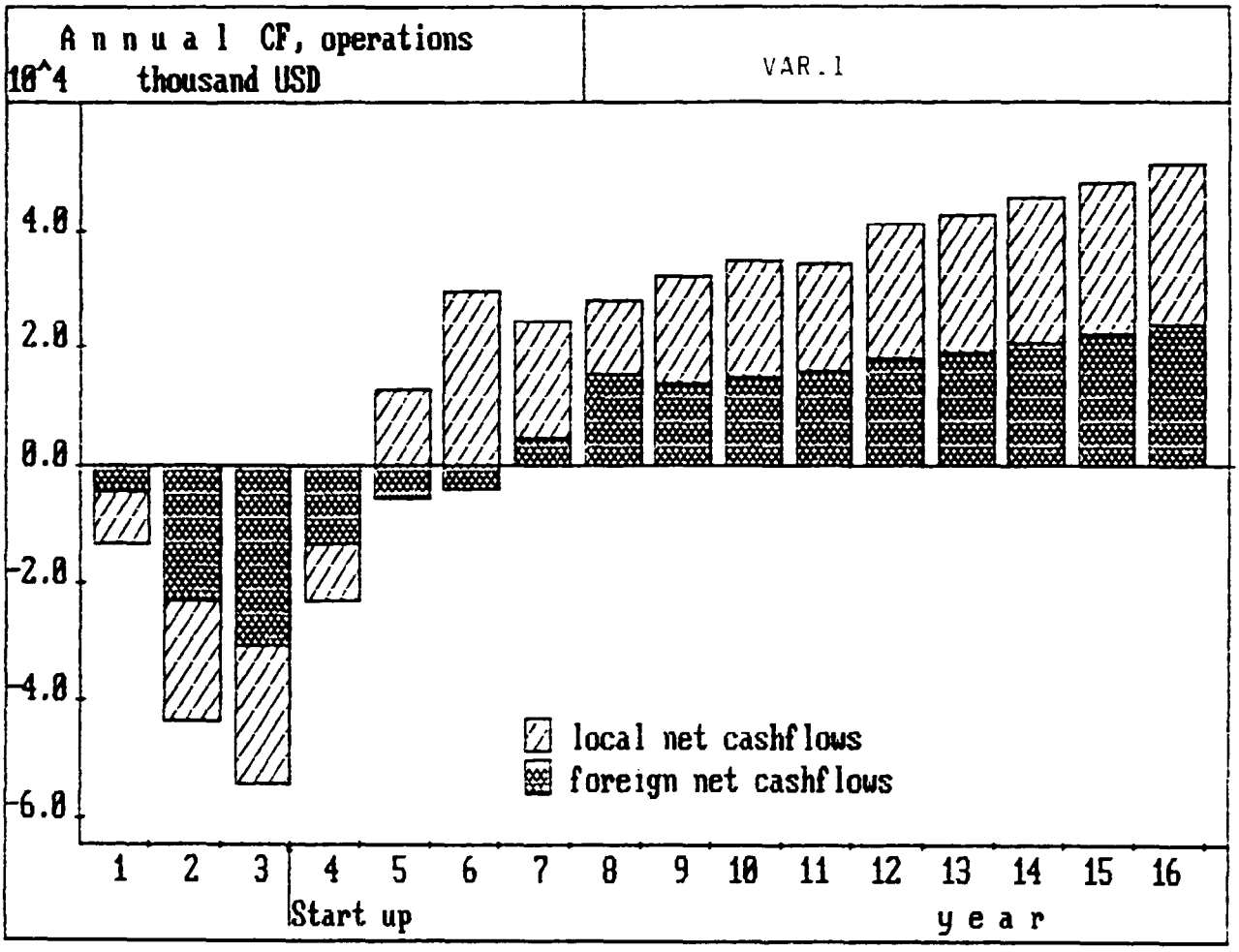

Discounted return on NetWorth
10^5 thousand USD
compare chart
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
present value, base
compare 1
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
0
5
10
15
20
25
30
35
discounting rate (%)

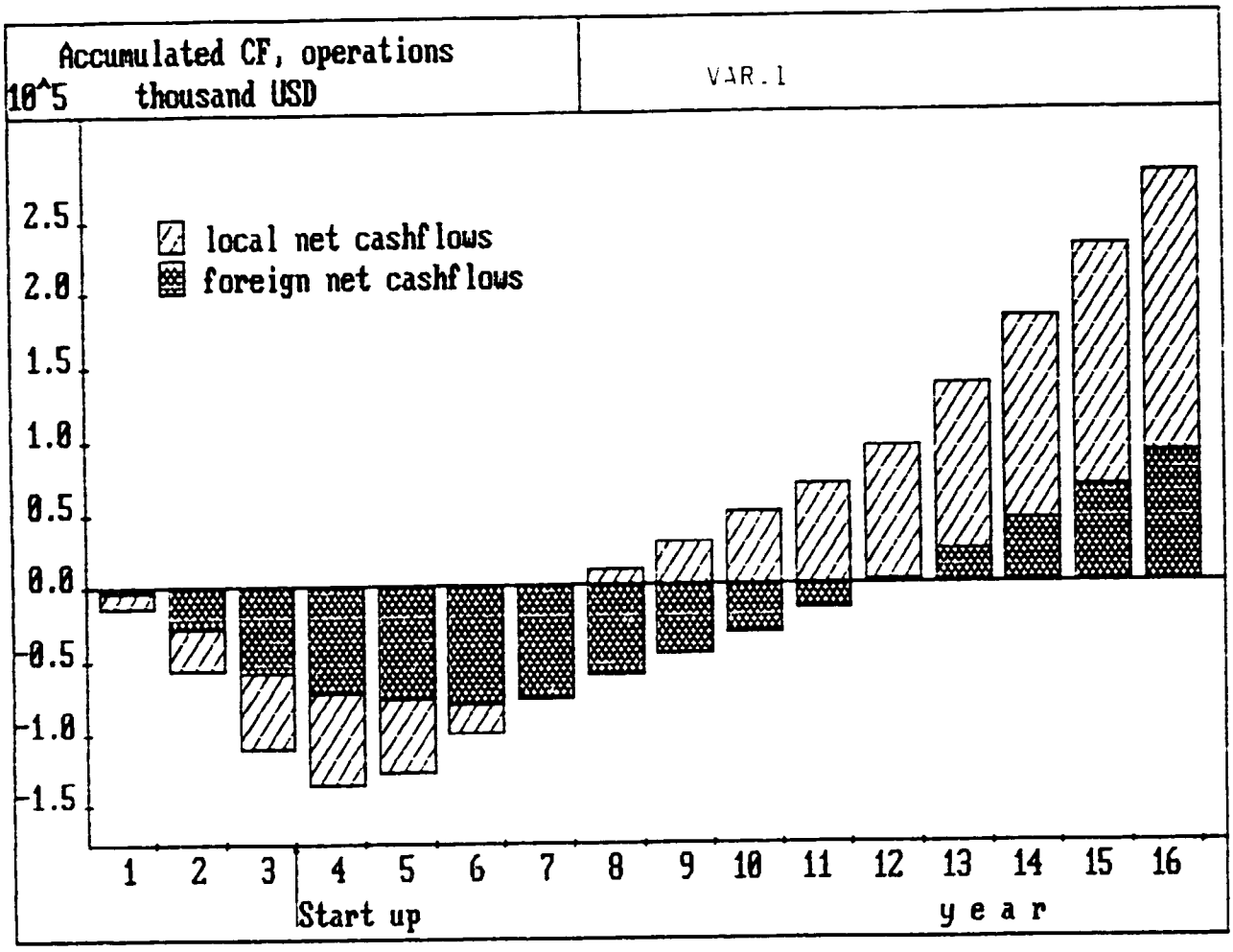

Net Profit / Total Sales ratio in (%)
compare chart
0
-20
-40
-60
base case
compare 1
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

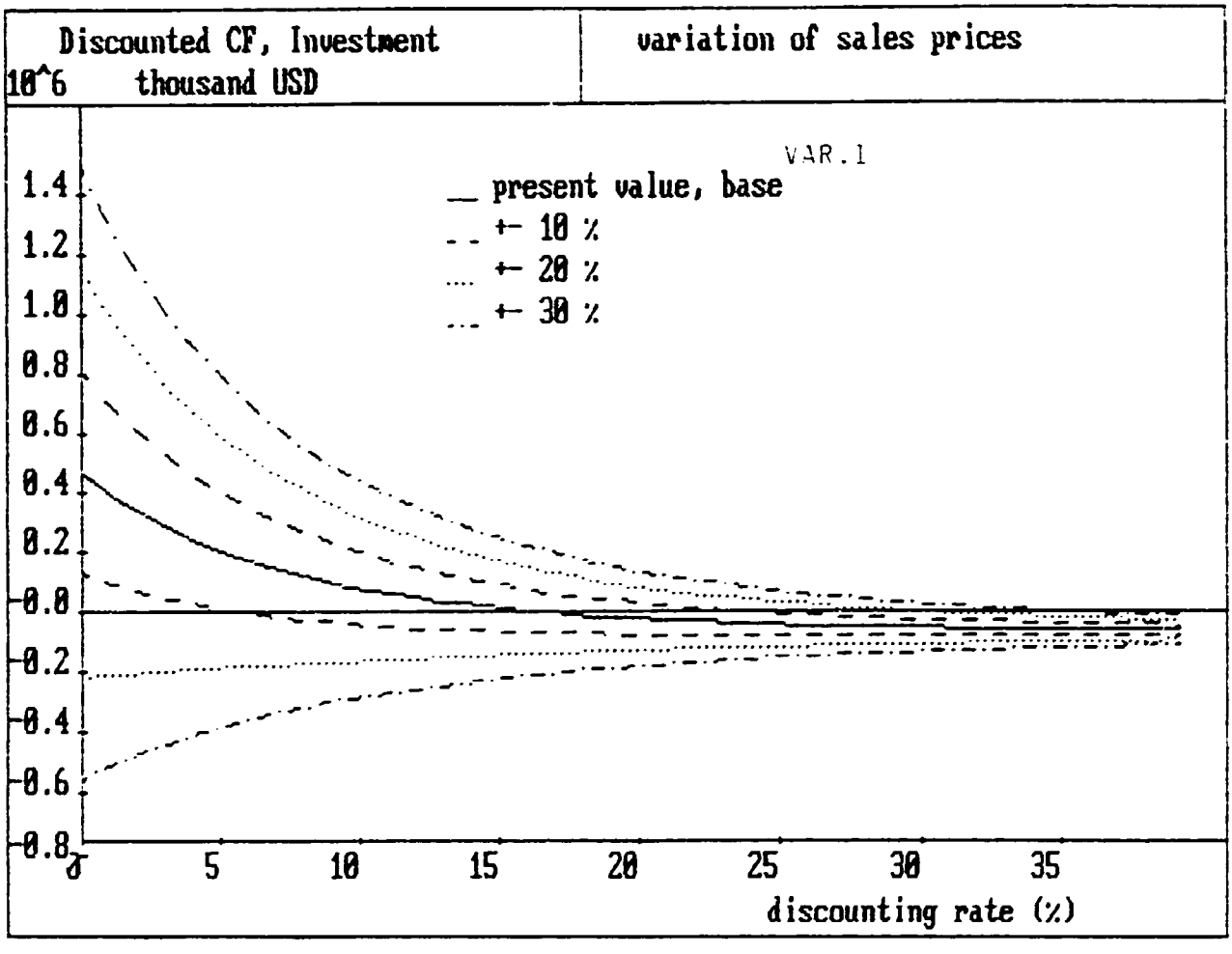

Net Cashflow / Total Sales
10^2 ratio in (%)
compare chart
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
base case
compare 1
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

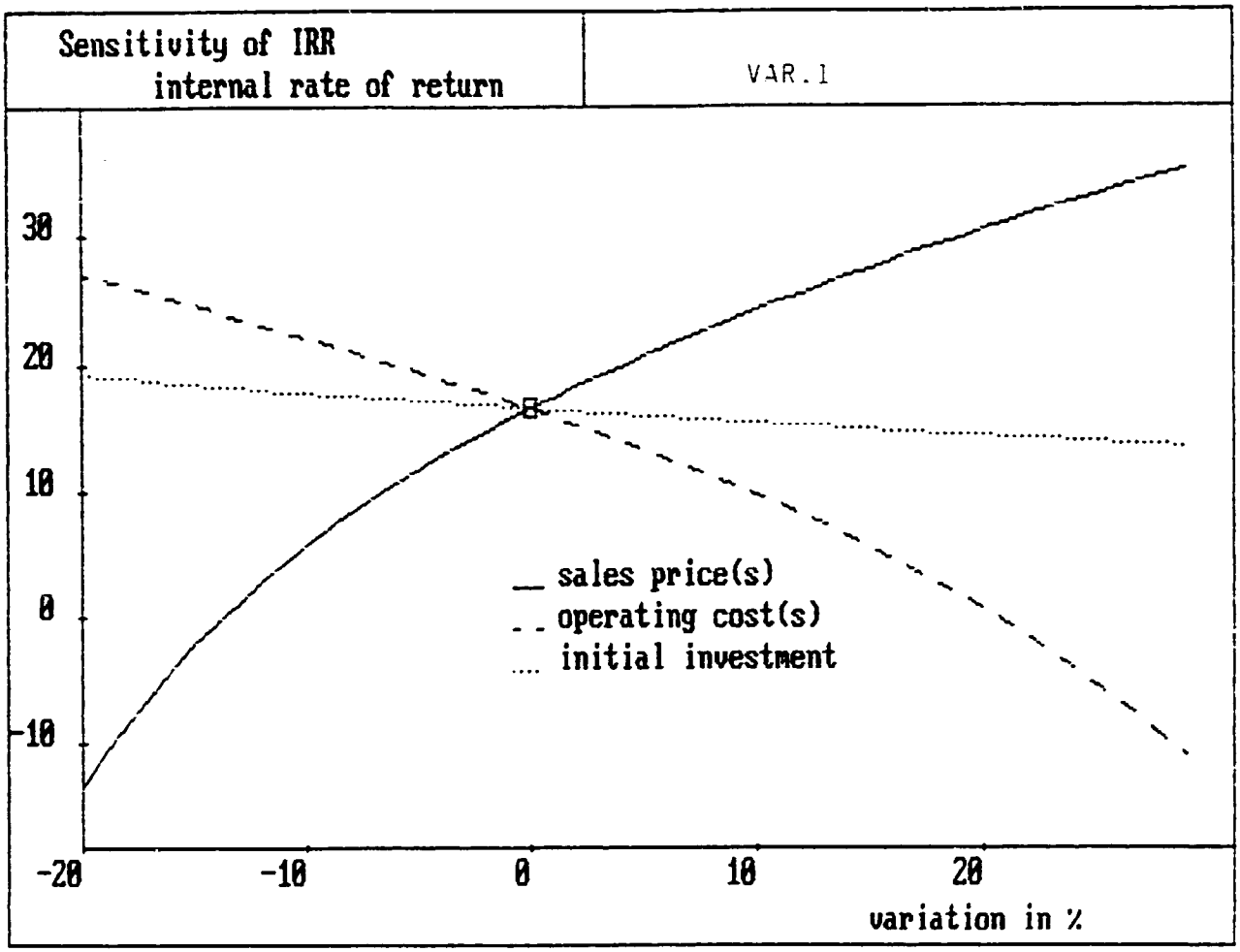
COMFAR 2.1


Debt Service Ratio, by year
net cashflow/debt service
compare chart
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
4.0
2.0
0.0
-2.0
base case
compare 1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Annual CF, operations
10^4 thousand USD
VAR.1
4.0
2.0
0.0
-2.0
-4.0
-6.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
year

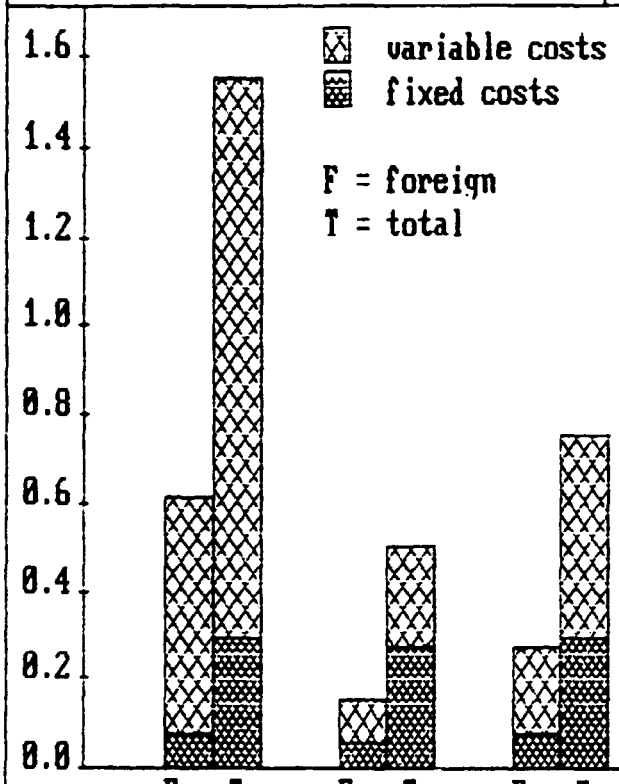

Accumulated CF, operations
10^5 thousand USD
VAR.1
local net cashflows
foreign net cashflows
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year


Discounted CF, Investment
10^6 thousand USD
variation of sales prices
VAR.1
present value, base
+- 10 %
+- 20 %
+- 30 %
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
0
5
10
15
20
25
30
35
discounting rate (%)


Sensitivity of IRR
internal rate of return
VAR.1
30
20
10
0
-10
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment

Structure of Production Costs
10^5 thousand USD

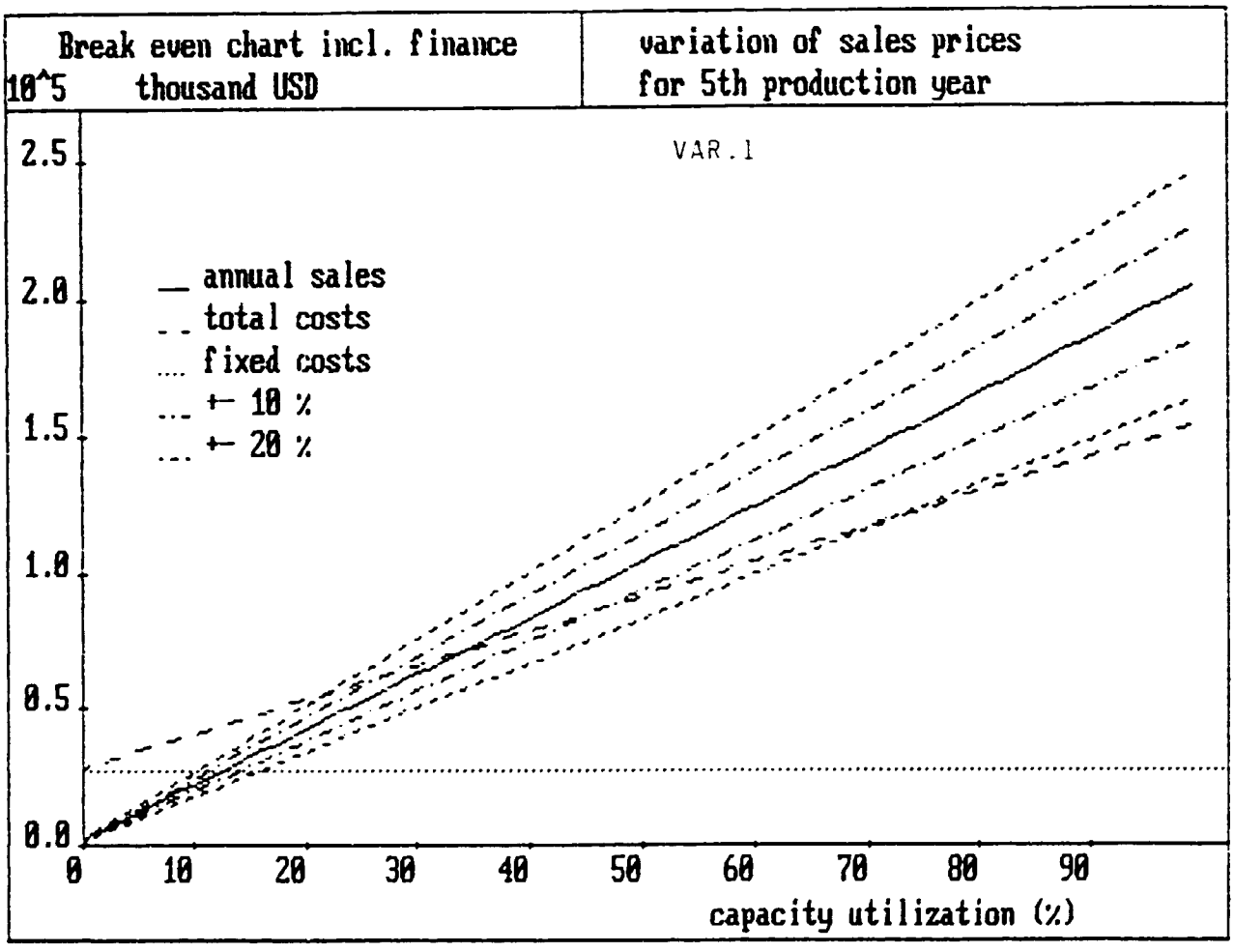
for 5th production year

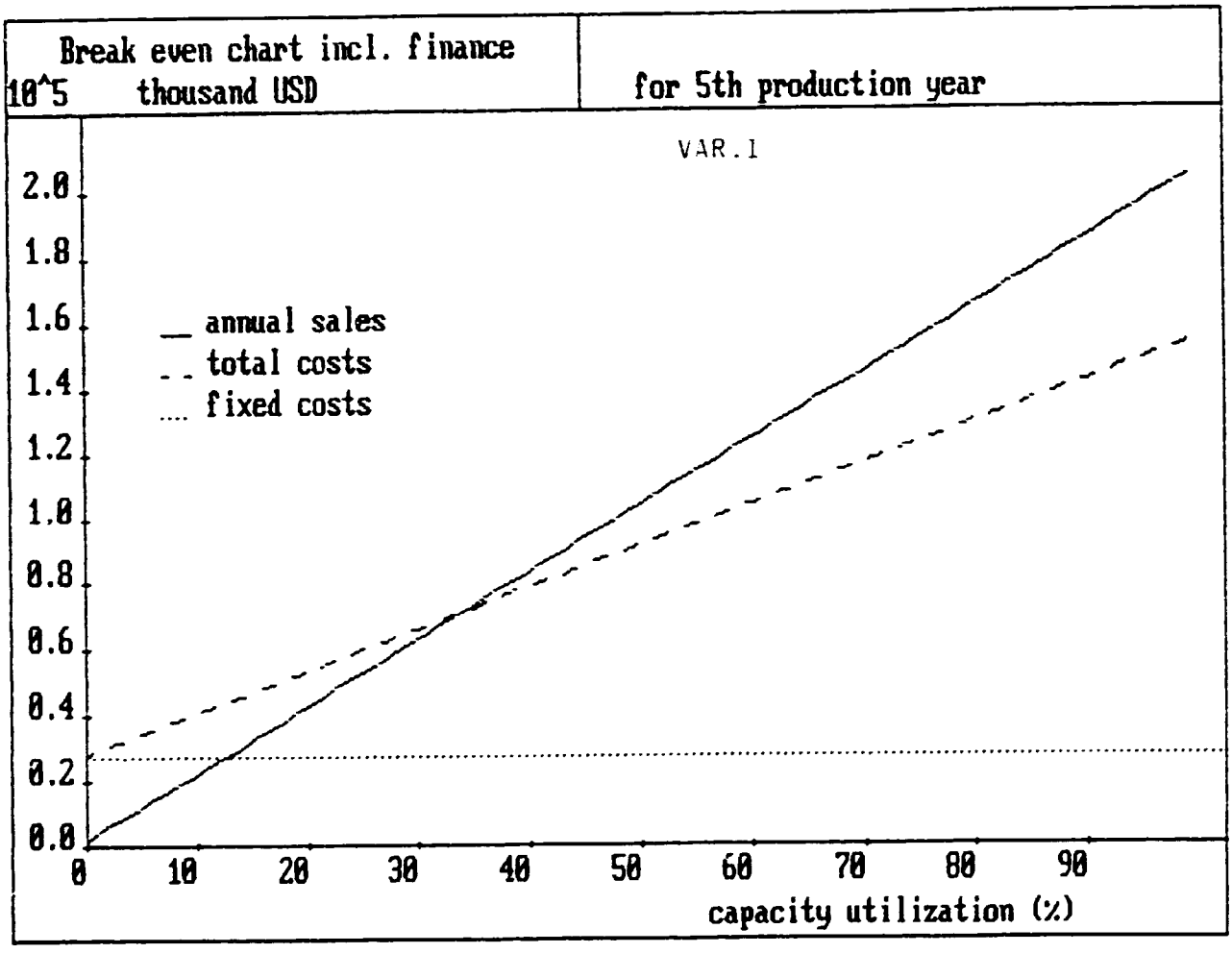


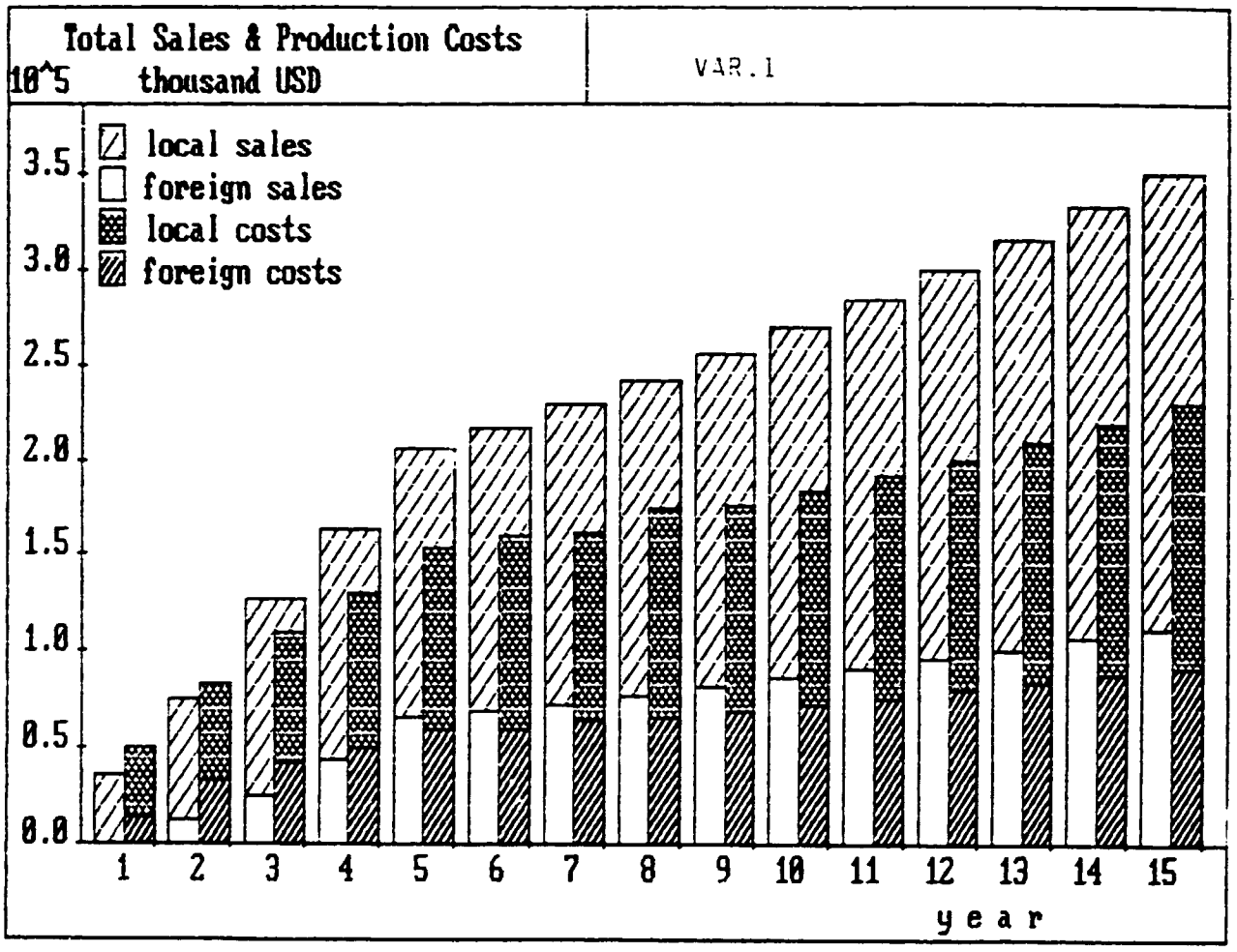
Nominal	Start up	
71.43	39.91	raw material
6.77	4.60	other RM
3.08	4.17	utilities
0.14	0.20	energy
0.95	3.31	labour
1.13	2.43	maintenance
0.59	0.64	spares
7.92	17.49	overheads
4.37	12.51	depreciation
3.61	14.75	interest
100.00	100.00	Total Prod C.

VAR.1

production level


Break even chart incl. finance
10^5 thousand USD
variation of sales prices
for 5th production year
VAR.1
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break even chart incl. finance
10^5 thousand USD
for 5th production year
VAR.1
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Total Sales & Production Costs
10^5 thousand USD
VAR.1
local sales
foreign sales
local costs
foreign costs
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
year

1.9. CONCLUSION

The prepared pre-feasibility study has proved the correctness of the idea on the effectivity of production of vehicles directly in the region with maximal own production of components for the final product. The market with road vehicles in the region is clearly unsaturated in all segments.

The problem of unseturation is, however, connected with the level of economic and social systems in the countries of the region. The volumes of GNP as well as other specific indicators are at a very low level as compared to countries of at least average economic standard.

The political situation in the region is not stable. Therefore, the only stabilized factor seems to be the trend of growth of the number of inhabitants. The average annual increment in Ethiopia reaches the value of 3.1%. Ve assume this fact will positively affect the growth of the market demand for trucks. Another issue is that to deal with development at the market with passenger cars is useless under this situation, as passenger cars do not solve basic needs of goods transport. Therefore, the attention was concentrated just to the market with trucks, regarding the marketing point of view, and namely to the group of vehicles with loading capacity up to 10 ton. This group features the significantly largest demand in the future period. Because of low stability of these data, two alternatives of the future demand were considered - a pessimistic one and an optimistic one. Values of the volume of transported goods and transport output have been selected to be variables.

The variant of spare parts manufacture for utilized vehicles leads to the basic problem of a specific production programme and of the quantity of individual produced spare parts. This is caused by the fact that the range of utilized vehicles in the East African region is very wide due to different imports and at the same time the numbers of individual types are relatively low.

The variant of manufacture of selected components for another is also not realistic due to the nonexistence of another final producer of road vehicles in the region.

For this reason both the variants of spare parts manufacture for utilized vehicles and of components manufacture for another final producer were abandoned due to their technical and economical non-feasibility.

Due to high demands for imports of components for road vehicles final assembly and to bad experience with providing the regional market with road vehicles completed from imported parts only the variant of vehicles manufacture with a maximum share of components production was subjected to a detailed analysis.

The resulting demand for these trucks cannot be naturally expected to be satisfied exclusively by a future domestic producer, to the contrary, more active operations of other participants at the market, especially importers, can be expected.

Therefore, dimensioning of the capacity of the production plant in AKAKI has been determined, in compliance with the realistic technical possibilities, in variants ranging from 1500 pieces up to 5000 pieces of annual production, which approximately makes 30% up to 50% of the regional market demand.

Based on the economic analysis, the Variant 1 can be recommended to be subject to a more detailed technical and economic analysis due to the disputable possibility of providing for a two-shift operation in the given region.

This variant always makes it possible to increase the utilization of the production machinery and growth of annual production up to 5000 trucks per year.

In conclusion, the following facts can be stated:

- the market demand for trucks depends on the development of the economical situation in the region;
- the political stability determines the trend of development of the economical situation in the region;
- the projected growth of the number of inhabitants may result in the necessity to increase the volume of transported goods and, subsequently, the number of trucks;
- an integral part of increasing of the number of vehicles is general increase of the level of infrastructure in the region;
- the high requirements on imports in the region and the small volume of exports result in a chronical lack of convertible currency;
- the potential consumers - users of trucks are mainly state-owned institutions;
- gradual formation of a market environment in the region can be expected;
- the price of trucks in Ethiopia ranges from US$ 75 thousand up to 120 thousand;
- the restructuring of AKAKI Spare Parts and Hand Tools Factory, Ethiopia for production of trucks is commercially, technically and financialy feasible;
- the effect of the proposed production system on the environment is minimal;
- the restructuring of the plant in AKAKI requires new jobs (about 600 - 1,200 workers according to the variant of the design);
- the ratio of own production of components in the AKAKI plant in the total set for the truck is about 50%.

The risks and uncertainties can be formulated as follows:

- political stability in the region;
- providing for the financing of the project;
- volume of the future market demand;
- economic environment in Ethiopia;
- supplying of the AKAKI plant with materials;

- cooperation of subcontractors from the region during production.

Action oriented recommendations

On the basis of the above mentioned facts and analysis following future actions can be recommended :

1. To inform relevant Ethiopian authorities of the findings and results of this study and to discuss with them the issue of future conditions for foreign investmens as the existing rules and regulations do not provide effective guarantee for foreign capital inflow.

2. To make a decision on the chosen variant of solution.

3. To elaborate a detailed feasibility or engineering study for the chosen variant.

4. To contact potential investors who could be interested in the project s implementation, especially renowned world manufacturers of road transport equipment as well as specialized banking institutions.

20706 (3 of 4)

UNIDO

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

FINAL REPORT

Project No. DU/RAF/89/850

REGIONAL DEVELOPMENT OF AN EXISTING PLANT FOR MANUFACTURE OF TRANSPORT MEANS AKAKI, ETHIOPIA

PRE - FEASIBILITY STUDY VOLUME I.

ELABORATED BY UNIDO
FOR THE ECONOMIC COMMISSION
FOR AFRICA FOR AFRICAN GOVERNMENTS

POLYTECHNA, Co.
Prague, Czech Republic

PROJEKTA Ltd.
Prague, Czech Republic

November 1993

NAME OF PROJECT

Manufacture of Equipment for Land, Rail and Vater Transport in Africa. Pre-feasibility Study for Development of AKAKI Spare Parts and Hand Tools Factory, Ethiopia.

Project No.: DU/RAF/89/850

Excution team:

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List of institutions and persons contacted during survey in Ethiopia.

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ASPF

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{General Manager, Mr. Asrat Sileshi, was abroad during the whole stay of the mission in Ethiopia}

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Mr. Jamal Ali - Financial Director

Mr. Mareska Volde Semayat - Sales and Marketing Director

UN - ECA

Mr. Louis Sangare - Director, Economic Cooperation

Mr. Mbaye Diouf - Senior Economist

Ministry of foreign Trade

Mr. Gizachew Gebre Michael - Export Promotion Officer

Ethiopian Freight Transport Corporation {NATRACO}

Mr. Hagos Gebre Vold - Head, Planning Department

National Bank of Ethiopia

Head of Credit Department - wished to remain anonymous; asked that we refrain from disclosing his name and the source of information

SUMMARY

Within the scope of transport systems development in African countries the Ethiopian ASPF plant was selected by a group of UN experts (see study No. DU/RAF/89/850) as a feasible base for securing the road transport development in the East African region.

This plant was put into operation in 1989 and is furnished with a solid base of machinery and equipment. Production programme consists mainly of custom - made spare parts for different types of machinery and hand tools. The marketing research was oriented at two main directions of the business plan for ASPF revitalization.

The first direction was oriented at the production of a selected type of road vehicle, the second at the production of certain components or spare parts for road motor vehicles.

For the alternative of implementing the strategy of the production of a selected type of vehicle the main aims were the following :

- establishing of own production of road vehicles suitable for the African region, utilizing local sources of labour, raw materials and production capacities
- providing economically priced road vehicles for the unsaturated market
- providing partially spare parts for the manufactured vehicles

The second alternative oriented at spare parts production was led by the effort to provide the market with spare parts for utilized vehicles which at present are generally in short supply.

On the basis of the above mentioned assumptions several variants of the ASPF plant restructuring were studied :

- assembly of road vehicles
- manufacture of road vehicles with a maximum share of components production
- manufacture of road vehicles components for another final producer
- manufacture of spare parts for utilized vehicles

The variant of spare parts manufacture for utilized vehicles leads to the basic problem of a specific production programme and of the quantity of individual produced spare parts. This is caused by the fact that the range of utilized vehicles in the East African region is very wide due to different imports and at the same time the numbers of individual types are relatively low.

The variant of manufacture of selected components for another is also not realistic due to the nonexistence of another final producer of road vehicles in the region.

For this reason both the variants of spare parts manufacture for utilized vehicles and of components manufacture for another final producer were abandoned due to their technical and economical non-feasibility.

Due to high demands for imports of components for road vehicles final assembly and to bad experience with providing the regional market with road vehicles completed from imported parts only the variant of vehicles manufacture with a maximum share of components production was subjected to a detailed analysis. This variant allows for satisfactory saturation of the demand for road vehicles on the market, minimization of costs and utilization of local production capacities and labour.

The pre-feasibility study contains the following four variants of road vehicles production in the revitalized ASPF plant :

VARIANT 1 - production of 3000 trucks annually in a single-shift working mode.
VARIANT 1A - production of 5000 trucks annually in a two-shift working mode.
VARIANT 2 - production of 1500 trucks annually in a single-shift working mode.
VARIANT 2A - production of 3000 trucks annually in a two-shift working mode.

Based on the economic and financial analysis Variant 1 was found to be the most suitable both from the technical and from the economic point of view. Its main characteristics are following:

nominal production	3.000 pcs
Total investment costa	122 mil. USD
NPV	55,1 mil. USD
IRR	16,6 %
Payback period	6 years

Further implementation of the project is dependent on the discussion of its features and conditions with representatives of the Ethiopian government, on finding a suitable investor and on the elaboration of a feasibility or engineering study of the chosen variant.

Key words:

East African region
AKAKI Spare Parts and Hand Tools Factory
Road transport equipment
Privatization
Restructuring of production
Regional integration

CONTENTS

Part 1

Part 2

Annexes:

List of Used Abbreviations, Symbols and Units

PCP	- Passenger Car Privata
PCO	- Passenger Car Others
BU	- Bus
TRL	- Truck under 10 t
TRH	- Truck over 10 t
TNK	- Tanker
TL	- Trailer
MC	- Motorcycle
t	- Metric Ton
t/km	- Metric Ton-Kilometre
kV	- Kilo Vatt
MV	- Mega Vatt
MVh	- Mega Vatt Hour
h	- Hour
l	- Litre
m^2	- Metre Square
m^3	- Metre Cubic
kg	- Kilogram
1 Birr	- 0.2 USD (US$)
ASPF	- AKAKI SPARE PARTS AND HAND TOOLS FACTORY
1 ETB	- 1 Birr
NPV	- Net Present Value
IRR	- Internal rate of return
CF	- Cash Flow
DCF	- Discounted Cash Flow

1. EXECUTIVE SUMMARY

1.1 PROJECT BACKGROUND AND HISTORY

This pre - feasibility study of the market with road transport equipment in the region of East Africa and restructuring of AKAKI Spare Parts and Hand Tools Factory, Ethiopia, is a part of an umrella project No. DU/RAF/89/850 on the development of transport equipment products in the four regions of Africa (Vest, Central, East and South). The study was preceded by a diagnostic survey in individual countries of the regions and of the situation in some individual plants. Based on the recommendations of a steering committee where ECA, UBDP, UNIDO, EPDF, OAU and various governments were represented the entire project was segmented into two groups of existing plants in the four African regions which could, if improved, contribute to the industrial and regional integration of each subregion.

For the needs of possible future production of road transport equipment, AKAKI Spare Parts and Hand Tools Factory in Ethiopia has been identified. This plant has been put into operation in 1989 and has not acquired its nominal production due to sales problems.
Possible production of a selected group of vehicles and spare parts is to be realized at the domestic market and at the markets of other countries of the region.

The task of this study thus is now verify the market with road vehicles in the region, to determine the market demand, to select a suitable type of vehicle to be produced in AKAKI, to design the restructuring of the production of transport equipmentor complete vehicles and to verifly the financial and economic effectivity of the designed future regional plant.

Both politically and economically Ethiopia is now in a transitional period which should and by new elections, planned for January 1994. It remains to be seen what economic policy the

new government will adopt to reach the proclaimed target of privatization and free market economy. The analysis shows, however, that without some form of privatization of the AKAKI plant the effective restructuring of its production vould be very problematic. It also shows that solely by upgrading the existing production of parts and components no effective contribution to the issue of road transport development can be reached due to a wide range of utilized road vehicles and therefore to the impossibility of installing effective batch production of parts. For this reason the study recommendes a package strategy of manufacturing and marketing a selected type of vehicle.

1.2. GENERAL INDICATORS

The market with motor vehicles in the Estern region of Africa is very lightly developed, especially in the segment of trucks where the rate achieves 0.15 vehicle per thousand inhabitants. One assembly plant - FIAT/IVECO Vhose imports are almost complitely imported with capacity of approximately 2,500 trucks annually is situated in the region, however, its actual production is about 200 (1990) up to 500 (1991) vehicles. The reason is a chronical lack of convertible funds in the country for purchases of components for assembly.

No organized market of distributors exists, imports of vehicles are realized individually and in a disorganized manner.

Neither a service network is created, with the exception of several trade-mark service centers for passenger cars.

The main road transporter is Ethiopian Freight Transport Corporation - a state-owned company, which realizes about 85% of the total freight transport in the country. The remaining part is realized by small, also private forwarders.

Prices of trucks at the market ranges from US$ 75 000 up to 120 000.

The future market demand is directly proportional to:
- the level of development of the national economic system;
- the volume of transported goods;
- the growth in the number of inhabitants;
- the level of development of the infrastructure in the region;
- the purchase power of potential buyers;
- political stability.

With the optimistic variant of development, the following market demand for trucks in Ethiopia can be approximately expected:

YEAR	1992	1995	1998	2000	2005
number of trucks in pieces	2191	3500	5800	8500	10200

With the pessimistic alternative, the maximal annual demand for trucks will probably reach the following levels:

YEAR	1992	1995	1998	2000	2005
number of trucks in pieces	2191	2400	3000	3900	6300

The difference between both alternatives reflects the uncertainly zof the future economic development in the region in all its aspocts and the ensuring development of its perchasing power.

1.3. MARKETING CONCEPT

From the entire mixture of the market demand for individual groups of road vehicles, the highest demand is for trucks with loading capacity up to 10 tons. Production of these vehicles is technically and commercially feasible under certain conditions in AKAKI Spare Parts and Hand Tools Factory, Ethiopia, which has been selected during previous researches as a suitable plant for possible production of vehicles or spare parts.

The total number of required vehicles with loading capacity up to 10 tons at the Ethiopian market can be estimated as follows (in both the optimistic and pessimistic alternatives):

		1992	1997	2000	2005
number of trucks (pc)	optimistic	1527	2500	6000	9500
	pessimistic	1527	2000	2700	4500

Totally, the following way of realizing the required trucks is thus assumed:

Vehicle Type	Satisfying the Demand by:
Trucks with loading capacity over 10 t	imports
Trucks with loading capacity up to 10 t	30 - 50 % production in AKAKI 50 - 70 % imports

Passenger cars will only be imported into the region.

Within production of vehicles in the AKAKI plant, different modifications (towing vehicles, dump trucks, tractors, etc.) are expected to be produced in addition to the basic model - flat truck.

The orientation price of the final product - truck, is US$ 60.850. This price respects both estimated production costs and necessity of on the region's market.

The above mentioned facts are used as a basis for the variants of designed reconstruction of AKAKI to production of trucks.

The particular production implementation curves are as follows:

VARIANT 1 - production of 3000 trucks in a single-shift working mode.

year	1	2	3	4	5
numoer of cars	600	1300	2050	2500	3000

VARIANT 1A - production of 5000 trucks in a two-shift working mode.

year	1	2	3	4	5
number of cars	660	1300	2100	2800	3900

VARIANT 2 - production of 1500 trucks in a single-shift working mode.

year	1	2	3	4
number of cars	330	900	1200	1500

VARIANT 2A - production of 3000 trucks in a two-shift working mode.

year	1	2	3	4	5	6
number of cars	660	1250	2050	2500	2900	3000

Capacity of the plant is limited by the capacity of the existing mechanical machining shop. The ratio of own production of components for the final product in AKAKI is about 50%.

1.4. RAW MATERIAL INPUTS AND FACTORY SUPPLIES

The following volumes of materials will have to be provided for production:

Consumption of Major Materials (ton)

Material	Variant			
	1	1A	2	2A
Sub-supplies	13 790	25 281	6 895	13 700
including wheel disks	1 050	1 925	525	1 050
	21 000 pc	38 500	21 000 pc	
tyres	2 500	4 583	1 250	2 500
	21 000 pc	38 500	21 000 pc	
batteries	240	440	120	240
	6 000 pc	11 000 pc	3 000 pc	6 000 pc
electric installation material	105	192.5	52.5	105
Metallurgical material	8 900	16 317	4 450	8 900
including plates	5 500	10 083	2 750	5 500
profiles, tubes rods	3 400	6 233	1 700	3 400
cabin pressings	1 050	1 925	525	1 050
forgings	1 100	2 016	550	1 100
castings	1 300	2 383	650	1 300
upholstery	108	198	54	108
paints	390	715	195	390
oils, lubricators, etc.	300	550	150	300
combustible material	620	1 136	310	620
chemicals	200	366	100	200
overheads material	220	400	110	220
metal scrap	1 692	3 102	864	1 692
non-metal scrap	320	584	160	320

The sub-supplies for production are partially available in the region (tyres, rubber parts, batteries, starters, alternators, radiators, filters, exhausters, sheets, dampers, brake lining, leaf springs, etc.), a reduced part of components will have to be imported from selected producers (e.g. engines, pressings for cabins, axles, etc.).

1.5. LOCATION, SITE AND ENVIRONMENT

The selected plant for production of trucks - AKAKI Spare Parts and Hand Tools Factory, is situated about 25 km from the capital of Ethiopia at a main road connecting Addis Ababa with the port of Assak in the distance of about 850 km. There is also a railway line quite near the plant, in the direction Addis Ababa - Djibouti. Thus the position of the plant, regarding the transport of materials, is very advantageous.

The altitude is about 2000 m, day temperatures reach 20 up to 25^{o}C.

The designed type of production can be considered to be ecologically friendly. Realization of effective devices limiting production of harmful substances is assumed. The project will create jobs for about 1100 workers.

1.6. ENGINEERING SITUATION AND TECHNOLOGY

The technological and technical design of the reconstruction of AKAKI is based on the assumption that the existing system of the mechanical machining shop will be maintained in its full range for production of vehicles. Therefore, this system is limiting for realistic designs. All existing facilities in the plant will be used for the new production system.
The new buildings include:

- body & assembly building;
- building for production of electric installation & upholstery workshop;
- repairs;
- transfer hall;
- central maintenance;
- store-house for tyres;
- st re-house for fuel;

- compressor station;
- store-house for gases;
- store-house for waste.

The total floor area of these buildings is about 38 thousand square meters in the variant 1 and 27 thousand square meters in the variant 2.

The buildings are designed to maintain the logics of the technical flows during production.

The projected expansion of the plant will result in its increase by about 130,000 square meters. From the technical point of view, the system is based on the aim to ensure a significant ratio of own production components in the plant, in fact own production will be represented with 50% of the entire set of components forming the final product - truck. The concept considers complex mechanical machining, thermal treatment (foundry, hardening shop, forge), welding of body parts, varnishing and assembly. Own production also includes gearboxes.

The main imported sets are engine and axles. The power requirements of the plant are provided in a corresponding way. Vaste technical water is neutralized, emissions of harmful substances are minimized.

Both basic variants of the design (Variant 1 = 3,000 vehicles per year, Variant 2 = 1,500 vehicles per year) are considered for the single-shift utilization of the production machanical, and they are modified for the case of the two-shift utilization (Variant 1A = 5,000 vehicles per year, Variant 2A = 3,000 vehicles per year).

1.7. HUMAN RESOURCES

Vorkers of the future plant for production of vehicles will be trained abroad in selected professions (about 50 workers). Besides, supervision of about 30 specialists in the plant during the implementation of production is assumed.

The particular number of workers required for production of trucks in the individual sub-systems is as follows:

Number of Workers

The following numbers in the individual sub-systems of production of vehicles are assumed:

Section - Category	Number of Workers			
	VARIANT			
	1	1A	2	2A
Mechanical production	222	371	122	222
including production workmen	145	250	73	145
overheads workmen	63	100	33	63
Forge	20	39	10	20
Hardening shop	24	45	12	24
Foundry	40	70	20	40
Body & Assembly production	552	968	283	552
including production workmen	356	648	178	356
overheads workmen	151	257	79	151
Upholstery & el. installation	40	67	20	40
Central maintenance	24	43	12	24
Store-house for sub-supplies, oils, combustible matters, waste & gases	40	70	20	40
Tyres and batteries	9	15	5	9
Other	129	212	65	129
TOTAL	1100	1900	569	1100
including production workmen	595	1078	298	595
overheads workmen	357	612	197	357
technical & admin. workers	148	210	74	148

1.8. FINANCIAL ANALYSIS

The proposed variants provide following results in the financial analysis.

	Variant			
	1	1A	2	2A
Total investment (thousand US$)	122,000	125,600	80,400	83,480
Net present Value (thousand US$)	55,123.2	111,555	4,531.7	83,110.5
Internal rate of return (%)	16.6	19.3	12.22	21.39
Pay back period (years)	6	6	9	5

Calculated disconnt rate: 11,5 %

The analysis has logically proved the profitability of the variants considering the two-shift utilization of the production machinery (1A, 2A).

Because of probable problems with organizing a two-shift working mode in the given region, however, these variants can be considered to be prospective onlz in the longer.

Therefore, the financially most profitable variant under these conditions is the Variant 1, i.e. production of 3000 pieces of trucks annually in the single-shift working mode.
In the case of favourable circumstances, this variant makes it possible to smoothly pass over to production of 5000 trucks per year in the two-shift operation.

1.9. CONCLUSION

The prepared pre-feasibility study has proved the correctness of the idea on the effectivity of production of vehicles directly in the region with maximal own production of components for the final product. The market with road vehicles in the region is clearly unsaturated in all segments.

The problem of unseturation is, however, connected with the level of economic and social systems in the countries of the region. The volumes of GNP as well as other specific indicators are at a very low level as confaced to countries of at least average economic standard.

The political situation in the region is not stable. Therefore, the only stabilized factor seems to be the trend of growth of the number of inhabitants. The average annual increment in Ethiopia reaches the value of 3.1%. We assure this fact will positively affect the growth of the market demand for trucks. Another issue is that to deal with development at the market with passenger cars is useless under this situation, as passenger cars do not solve basic needs of goods transport. Therefore, the attention was concentrated just to the market with trucks, regarding the marketing point of view, and namely to the group of vehicles with loading capacity up to 10 ton. This group features the significantly largest demand in the future period. Because of low stability of these data, two alternatives of the future demand were considered - a pessimistic one and an optimistic one. Values of the volume of transported goods and transport output have been selected to be variables.

The variant of spare parts manufacture for utilized vehicles leads to the basic problem of a specific production programme and of the quantity of individual produced spare parts. This is caused by the fact that the range of utilized vehicles in the East African region is very wide due to different imports and at the same time the numbers of individual types are relatively low.

The variant of manufacture of selected components for another is also not realistic due to the nonexistence of another final producer of road vehicles in the region.

For this reason both the variants of spare parts manufacture for utilized vehicles and of components manufacture for another final producer were abandoned due to their technical and economical non-feasibility.

Due to high demands for imports of components for road vehicles final assembly and to bad experience with providing the regional market with road vehicles completed from imported parts only the variant of vehicles manufacture with a maximum share of components production was subjected to a detailed analysis.

The resulting demand for these trucks cannot be naturally expected to be satisfied exclusively by a future domestic producer, to the contrary, more active operations of other participants at the market, especially importers, can be expected.

Therefore, dimensioning of the capacity of the production plant in AKAKI has been determined, in compliance with the realistic technical possibilities, in variants ranging from 1500 pieces up to 5000 pieces of annual production, which approximately makes 30% up to 50% of the regional market demand.

Based on the economic analysis, the Variant 1 can be recommended to be subject to a more detailed technical and economic analysis due to the disputable possibility of providing for a two-shift operation in the given region.

This variant always makes it possible to increase the utilization of the production machinery and growth of annual production up to 5000 trucks per year.

In conclusion, the following facts can be stated:

- the market demand for trucks depends on the development of the economical situation in the region;
- the political stability determines the trend of development of the economical situation in the region;
- the projected growth of the number of inhabitants may result in the necessity to increase the volume of transported goods and, subsequently, the number of trucks;
- an integral part of increasing of the number of vehicles is general increase of the level of infrastructure in the region;
- the high requirements on imports in the region and the small volume of exports result in a chronical lack of convertible currency;
- the potential consumers - users of trucks are mainly state-owned institutions;
- gradual formation of a market environment in the region can be expected;
- the price of trucks in Ethiopia ranges from US$ 75 thousand up to 120 thousand;
- the restructuring of AKAKI Spare Parts and Hand Tools Factory, Ethiopia for production of trucks is both technically financialy feasible;
- the effect of the proposed production system on the environment is minimal;
- the restrukturing of the plant in AKAKI requires new jobs (about 600 - 1,200 workers according to the variant of the design);
- the ratio of own production of components in the AKAKI plant in the total set for the truck is about 50%.

The risks and uncertainties can be formulated as follows:

- political stability in the region;
- providing for the financing of the project;
- volume of the future market demand;
- economic environment in Ethiopia;
- supplying of the AKAKI plant with materials;
- cooperation of subcontractors from the region during

production.

Action oriented recommendations

On the basis of the above mentioned facts and analysis following future actions can be recommended :

1. To inform relevant Ethiopian authorities of the findings and results of this study and to discuss with them the issue of future conditions for foreign investmens as the existing rules and regulations do not provide effective guarantee for foreign capital inflow.

2. To make a decision on the chosen variant of solution.

3. To elaborate a detailed feasibility or engineering study for the chosen variant.

4. To cantact potential investors who could be interested in the project s implementation, especially renowned world manufacturers of road transport equipment as well as specialized banking institutions.

2. PROJECT BACKGROUND AND HISTORY

East Africa, is a developing African subregion region from industrial, agricultural as well as social point of view. Within the project DU/RAF/89/850, researches in the field of development of transport systems have already been performed with the following results:

Background and Justification

The project on manufacture of transport equipment has been formulated within the framework of one of the key objectives of the UNTACDA programme: the promotion of cooperation among African countries as a step towards greater independence and self-reliance in the development of their transport equipment products.

This is necessitated by the fact that, at this early stage, when the transport system in Africa is barely meeting minimum service requirements, African countries are already spending an enormous portion of their foreign exchange earnings on equipment, accessories and spare parts for building the infrastructure as well as for providing the transport services. The annual rate of expenditure required to meet the development requirements of the Africa economy, is so high that only at the sacrifice of the development of the rest of the economy could the African countries manage to continue such spending. Statistical date shows that the rate of annual expenditure is climbing at an alarming rate to reach a figure of USD 47 billion by the year 2000.

While it is accepted that development of transport is crucial for economic development, it cannot be justified to spend such a large proportion of the hard currency of the rest of the economy. This consideration led to a search for ways and means of reducing the enormous share of foreign currency allocated to the transport sector while laying a firm foundation for its development. It was decided that the way of achieving this objective is by producing

locally some selected transport equipment, components and spare parts with the collective efforts and resources of various African countries organized in subregional or multinational groupings. This is also the surest way of achieving collective self reliance and sustainable development of transport services for the African countries.

A draft project proposal was submitted by ECA early in 1988 for implementing UNTACDA s objective for the promotion of an African industry in the field of transport equipment in accordance with resolution 86/3 of UNDP Governing council. After a series of revisions and negotiations UNDP agreed to finance the project so that it can be implemented under UNTACDA II. In April 1990 the Project Document was signed by UNDP, OAU (on behalf of African countries), ECA as the Executing Agency and UNIDO as the Associated Executive Agency, responsible for the pre-investment study.

The project consists of two parts:
- Diagnostic survey for the selection of 4 pilot regional plants and
- Pre-feasibility studies to be performed on four selected plants and four African sub-regions.

The diagnostic survey:

The diagnostic survey dealt with a survey of transport equipment manufacturing plants, assembly plants and repair and maintenance workshops. Two teams consisting of 3 experts each visited 12 countries and made study of 93 enterprises - 33 in West and Central Africa and 60 in East and Southern Africa.

By consideration of various factors such as existing facilities, conditions of equipment and infrastructure potentialities for expansion, size and quality of management and operating manpower, suitability for regional production and by establishing relative weights of criteria employed for comparison, the 93 enterprises

surveyed were listed in descending order of importance. The top enterprises selected for consideration were classified by region, by sub-region, by mode and, by sub-region and mode so that the countries in the sub- region could consider all possible alternatives and select a plant which can best serve the development of a mode of transport considered more crucial in solving the transport problem in that sub-region.

In the sub-region of East Africa the AKAKI plant Ethiopia was indentified as the best for future development towards subregional integration.

Pre-feasibility study

The purpose of the pre-feasibility study is to assist the Governments, the financial institutions and prospective private investors whether or not they should commit themselves and politically and financially to support the future regional investment project if viability and rentability is proven.

The elaboration of pre-feasibility study was subcontracted by UNIDO to Polytechna Ltd. Prague / Projekta Prague under the UNIDO contract No. 93/025.

3. MARKET ANALYSIS

3.1. PRODUCT

The subject of inquiry of this Pre-feasibility Study is availability of road transport vehicles in the relevant region of Africa. The product are thus road transport vehicles. According to their use characteristics, they can be divided into the following categories:

- passenger cars
- buses
- pick-ups
- light trucks - carrying capacity under 3 metric tons
- medium trucks - under 10 metric tons
- heavy trucks - over 10 metric tons
- special vehicles - trailers, semi-trailers etc.

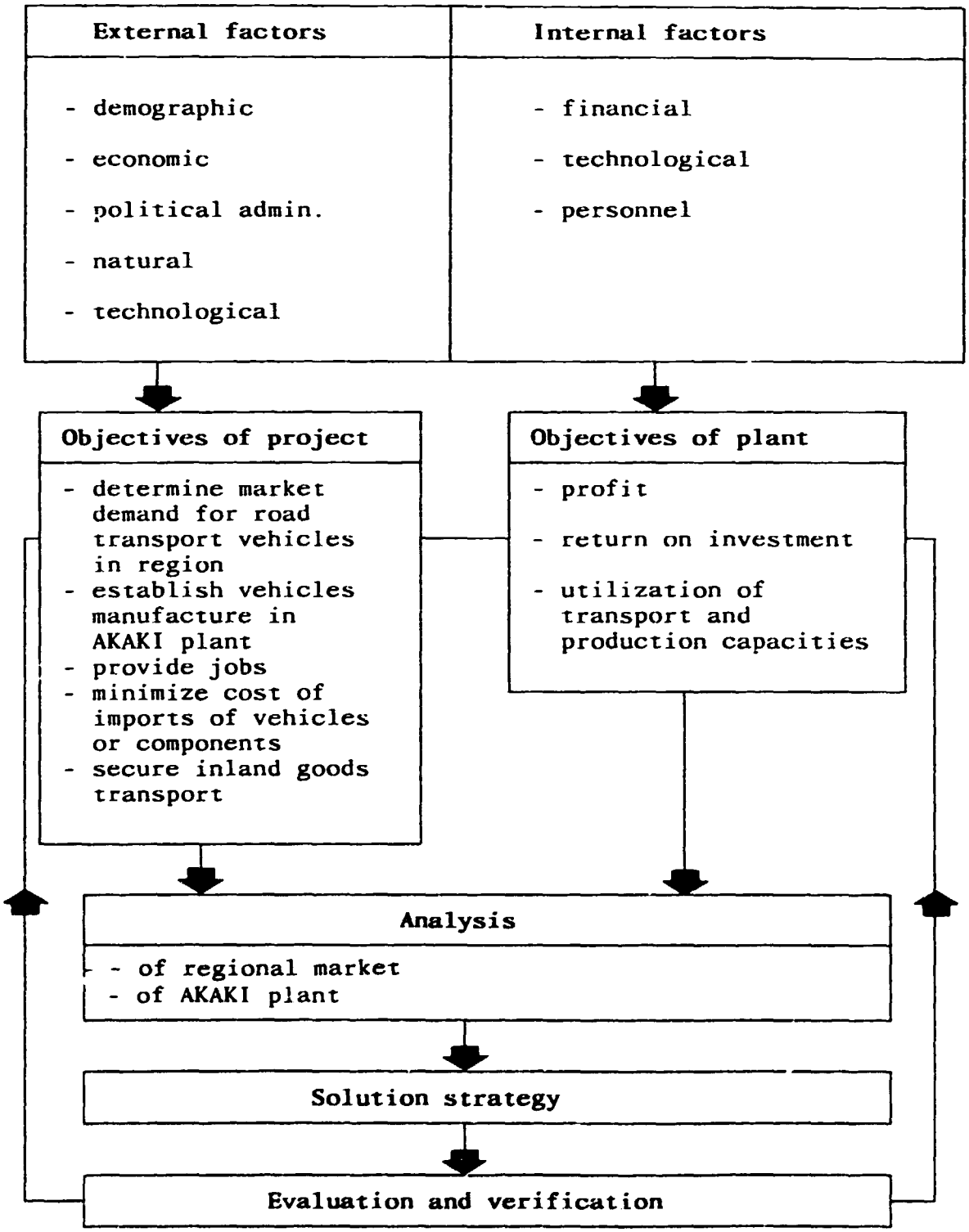
3.2. OBJECTIVES

The main task is to examine the situation on the road transport vehicle market in East Africa, and to define market requirements in individual categories.

The second aim is to consider possibilities of manufacturing a selected category of vehicles in AKAKI Spare Parts and Hand Tools Factory in Ethiopia, with a maximum share of domestic production.

A prerequisite is that demographic, economic, political administration, natural and technological factors are taken into consideration.

Model project



3.3. MAIN DATA ON ETHIOPIA AND THE REGION

The Ethiopia lies in the north-eastern region of Africa with an area of 1 200 000 Sq km. Population estimates vary but according to official UN statistics in mid-1988 population was 47,4 million with an average yearly growth of 2,9 per cent. The latest available figure for 1991 is 53,4 million.This gives population density of approximately 3,8 persons per sq km. These figures still include Eritrea which gained independence after the UN-supervised referendum held in April 1993.

Ethiopia is a unitary republic with its legal system based on the transilional charter approved by the council of representatives in July 1991. The national legislative body is the 87-member State Council (Council of Representatives) appointed in July 1991 by the Ethiopian People s Revolutionary Democratic Front (EPRDF). The state is headed by president Meles Zenawi, *de facto* and ratified by the Council.

The main political parties are represented by the EPRDF which is the coalition of armed groups which seized power in May 1991. It includes the Tigrey People s Liberation Front (TPLF) and the Ethiopian People s Democratic Movement (EPDM). 30 other groups are represented in the Council of Representatives. The Oromo Liberation Front (OLF) withdrew from the government in June 1992.

The general economic structure of the country is best documented by the tables taken over from the EIU Country Report No. 4/92 which is enclosed as the next page.

Ethiopia is ruled by a Provisional Government which focuses on a radical transition of both economic and social affairs. Its main target is a programme of comprehensive restructuring whose main principles were published in a general statement and include the folowing intentions:

Economic structure Ethiopia

Latest available figures

Macroeconomic indicators	1987	1988	1989	1990	1991
GDP at market prices[a] Birr bn	11.4	11.9	12.4	12.5	13.3
Real GDP growth[a] %	9.5	1.9	1.6	-0.4	-6.0
Consumer price inflation %	-2.4	7.0	7.9	5.1	35.8
Population m	47.2	48.6	50.2	51.7	53.4
Exports fob $ m	355	429	440	297	189
Imports cif $ m	1,066	1,129	951	1,081	472
Current account $ m	-218	-228	-137	-284	...
Reserves excl gold $ m	122.7	64.2	46.1	20.2	54.5
Total external debt $ m	2,715	2,984	3,030	3,263	3,475
External debt-service ratio %	33.0	41.2	37.0	33.3	25.4
Coffee production[b] '000 tons	173	162	206	175	216[c]
Exchange rate (av) Birr per $	2.07	2.07	2.07	2.07	2.07

December 21, 1992 Birr5.00 per $

Origins of gross domestic product 1990[a,b]	% of total
Agriculture	41.1
Industry	16.4
of which:	
manufacturing	7.6
Services	42.5
GDP at market prices	100.0

Components of gross domestic product 1991[a]	% of total
Private consumption	76.7
Government consumption	23.5
Gross capital formation	11.1
Exports of goods & services	9.0
Imports of goods & services	-20.3
GDP at factor cost	100.0

Principal exports 1990[a]	$ m
Coffee	196
Hides & skins	64
Pulses	17

Principal imports 1990[a]	$ m
Machinery	147
Motor vehicles	92
Crude petroleum	91

Main destinations of exports 1991[d]	% of total
Germany	15.3
Japan	14.6
Yemen	13.9
Djibouti	6.4

Main origins of imports 1991[d]	% of total
USA	20.6
USSR	16.2
Italy	8.9
Germany	8.4

[a] Fiscal years ending July 7. [b] Crop years (October-September) beginning in calendar years. [c] Industry estimate. [d] Based on partners' trade returns, subject to a wide margin of error.

- introduce new investment, commercial and labour codes to regain the confidence of both domestic and foreign investors.
- pursue a tight monetary policy, lower inflation and reduce government deficits, a programme of public sales of government bonds and bills is to be introduced.
- overhaul the tax system, expanding the existing tax base and inproving the collection of taxes.
- give the National Bank of Ethiopia greater autonomy and introduce a new regulatory structure for the other state banks with provision for the re-establishment of private banks and insurance companies, reform the civil service and greatly improved the state s capacity for economic management.
- evaluate the viability of public enterprises, selling those which are profitable and closing those which are not.

The whole programme is aimed at eventual privatization and introduction of a free-market economy. Its implementation is however still in the proclamative phase and concrete steps will probably be taken only by the government, which will be the result of elections in January 1994. So far the following main changes were made:

- devaluation of the Ethiopian Birr by almost 60% to the rate of 5.0 Birr per one US Dollar; over recent years the parallel market rate has been approximately 7-8-Birr per one US Dollar.
- raising state salaries and lowering income taxes.
- raising interest rates from the previous maximum of 12 % to interest rates on personal and business loans of between 11 % and 15 %.

- overhauling foreign-exchange allocations - in mid-November 1992 the eqivalent of Birr 75 million was allocated for private merchants and investors to import both consumer and investment goods. Priority has been given to the import of spare parts, notably for transport, capital equipment for small-scale industries etc.

A coordinated campaign to attract foreign investment to Ethiopia is under way according to the conditions of the new investment code (Proclamation No.15, 1992). All but large-scale energy projects, transport and financial services are now open to foreign investors. Subject to a minimum investment of USD 500 000 investors are allowed up to 100 % foreign equity holdings,15 % of productive capital can be imported duty free and tax breaks of up to three years are granted both to new investors and those reinvesting profits.

Ethiopia s true level of inflation is far from clear government officials speak of a 15 % increase over the 1991/1992 fiscal year while in late October, an IMF statement said inflation had risen to more than 21 % annually over last two years.

The other countries of the region are Somalia, Sudan, Kenya, Tanzania and Uganda. For main data on these countries, see Annex No. 3.

Note: The subcontractors are aware of the change which occurred when newly independent Eritrea seceded from Ethiopia. Because of insufficient information on the consequences of this change, all data in this report are still for the original extent of the territory of Ethiopia.

3.4. MARKET SIZE

The relevant market is the road transport vehicle market in East African region comprising the following countries, from the territorial viewpoint: Ethiopia, Somalia, Kenya, Sudan, Tanzania, Uganda.

The parameters of the region are:

- Area : 5 122,206 square km
- Population : 153.9 million
- Number of states : six
- Total GNP US $ 34,176 million

Country	Population (in 1000)	Average annual population increase (in %)	GNP (in mil. US $)	Average annual GNP increase (in %)	Per capita GNP (in US $)
Ethiopia	51,305	3.1	6,158	3.4	120,0
Somalia	8,512	3.2	999	1.5	117,4
Sudan	25,137	2.7	9,067	6.0	360,7
Kenya	25,369	4.2	9,127	4.8	359,8
Tanzania	26,038	3.3	4,081	3.9	156,7
Uganda	17,586	3.4	4,744	2.9	269,8

3.5. MARKET SEGMENTS

The market under review is so extensive and heterogeneous that it has to be divided into segments for the purpose of this analysis. The scheme shows the main segments, purpose-wise, of the road transport vehicle market. In view of the uneven level of marketing knowledge about the various countries of the region, two segments are considered here:

- segment of the commercial vehicle market in Ethiopia, and
- segment of the commercial vehicle market in the other countries of the region.

All groups of vehicles have been analyzed according to their use characteristics. Also market segments with regard to the product have been examined to the full extent.

SEGMENTS OF THE ROAD TRANSPORT VEHICLE MARKET

Breakdowns by:

Countries
Ethiopia
Somalia
Sudan
Kenya
Tanzania
Uganda

Kinds of vehicles
Passenger cars
Buses
Small commercial cars
Light trucks (under 3t)
Medium trucks (under 10t)
Heavy trucks (over 10t)
Special-purpose vehicles - trailers, semi-trailers etc.

Relationship to product
Manufacturers
Distributors
Users
Service

Level of marketing knowledge
Ethiopia
Other countries in region

3.6. MARKET PARTICIPANTS

Characteristic for the road vehicle market in the region is a low level of organization.To a limited extent, all participants share the market but none of the segments shows any signs of systematic approach.

3.6.1 Manufacturers

In Ethiopia, there is only one assembly plant in Addis Ababa, built under licence from the Italian company FIAT/IVECO; the Italian partner has a majority capital interest. The plant assembles trucks of various modifications and buses, exclusively from imported components.

The project capacity of the plant is about 1,500 vehicles a year, annual production is ca. 200 - 500 units. The reason for the difference between capacity and output is shortage of freely convertible currency for imports of components. The sales prices of the vehicles assembled in the plant in 1992 were:

Type		Price (Birr)	Price (US $)
180.304	Heavy truck	547,926	109,586
	Construction truck	583,262	116,652
135.174	Mini-truck	335,168	67,033
	Mini construction truck	367,759	73,552
E 135.17	Bus	569,017	113,803
E 79.14	Bus	237,817	47,563
	Trailer 7.5m	201,326	40,265

Note: Prices in US dollars were calculated at an exchange rate 5.00 Birr = 1 US $.
There are no automobile factories or assembly plants in the other countries in the region.

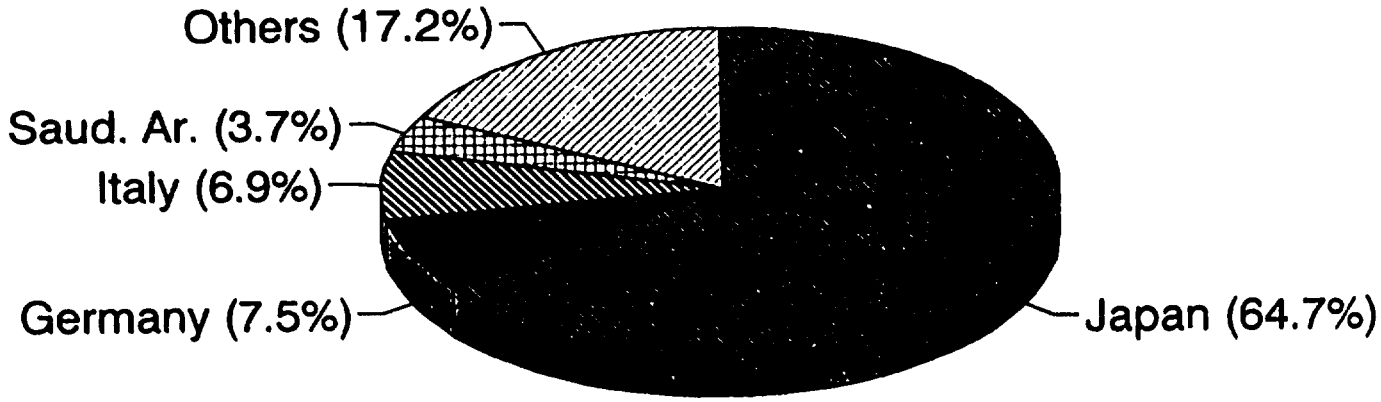
3.6.2. Distributors

The automobile distribution network in the region is disorganized. Minimum price is the only criterion for selection of suppliers. This results in purchases from a relatively large number of manufacturers, in very small quantities. Consequently, vehicles of a wide range of makes are in use in the region, in low numbers of vehicles made by one carmaker, and of single types of vehicles. Because of this situation, it is impossible to supply the market with spare parts in small batches, so that many vehicles are temporarily out of service due to defects.

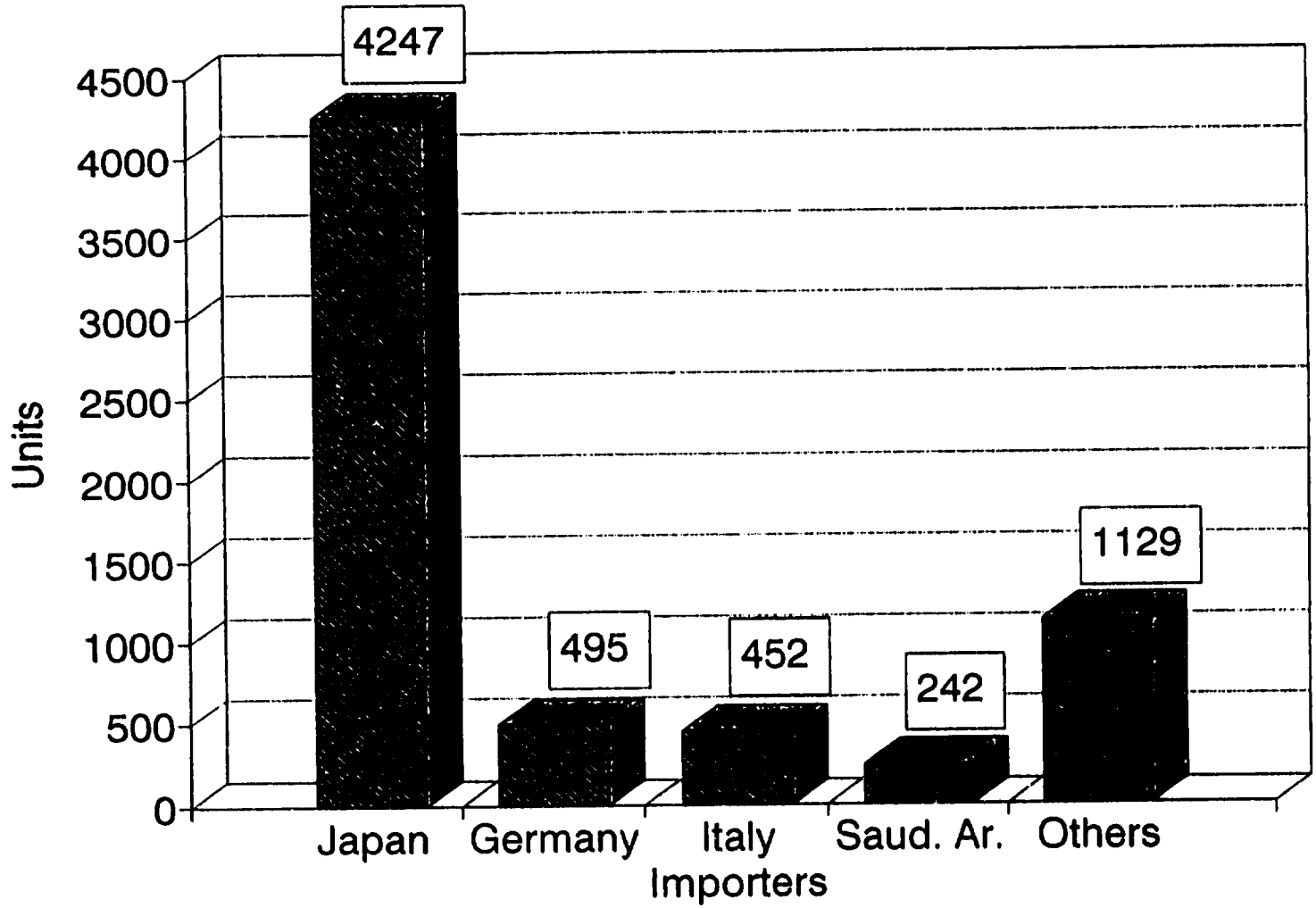
It is possible to say that an organized network of distributors does not exist; imports are handled by state transport organizations as well as private firms.

The following graphs show the main importers of vehicles to Ethiopia, and the number of imported automobiles in 1991.

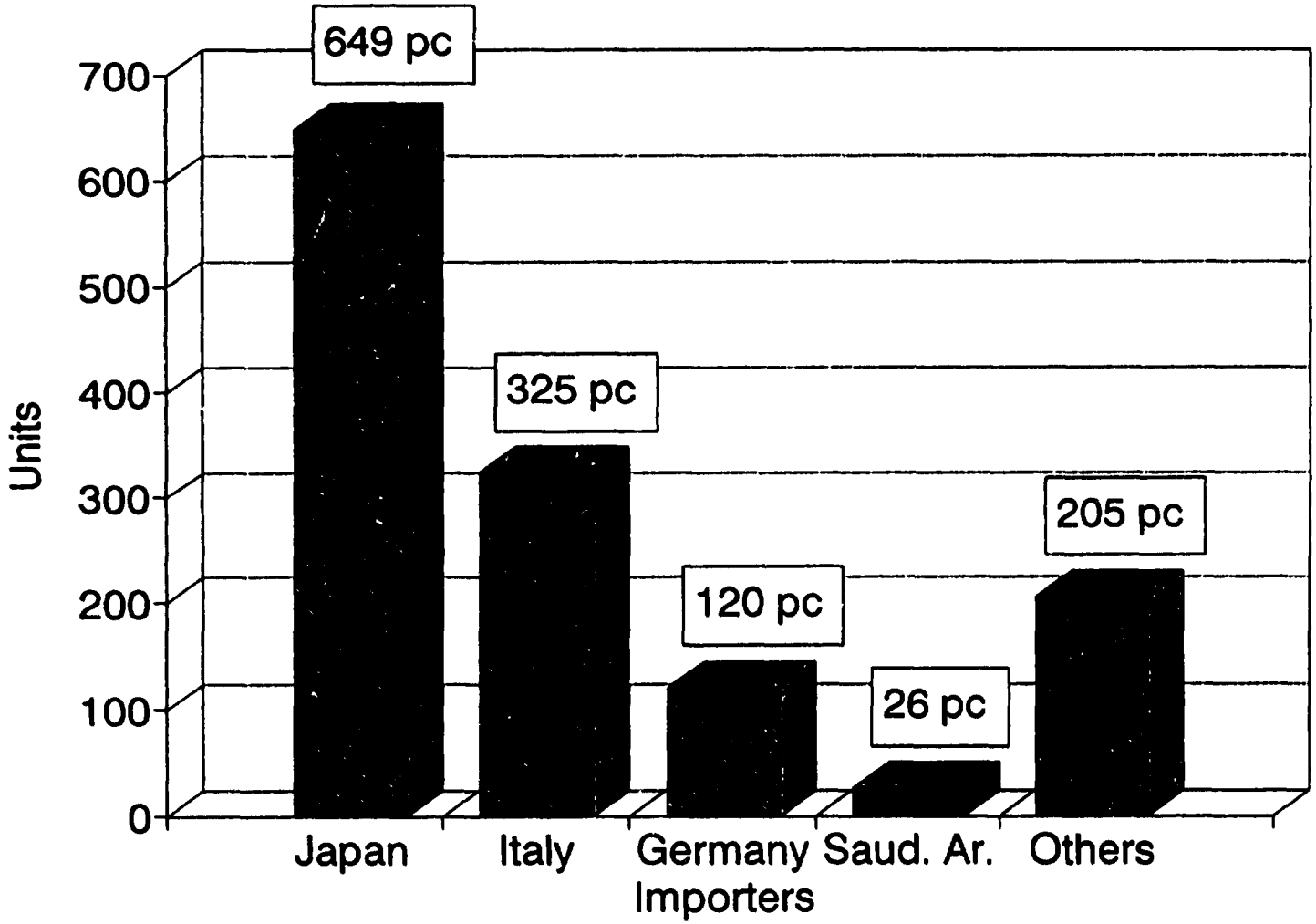
Major Imports of Vehicles



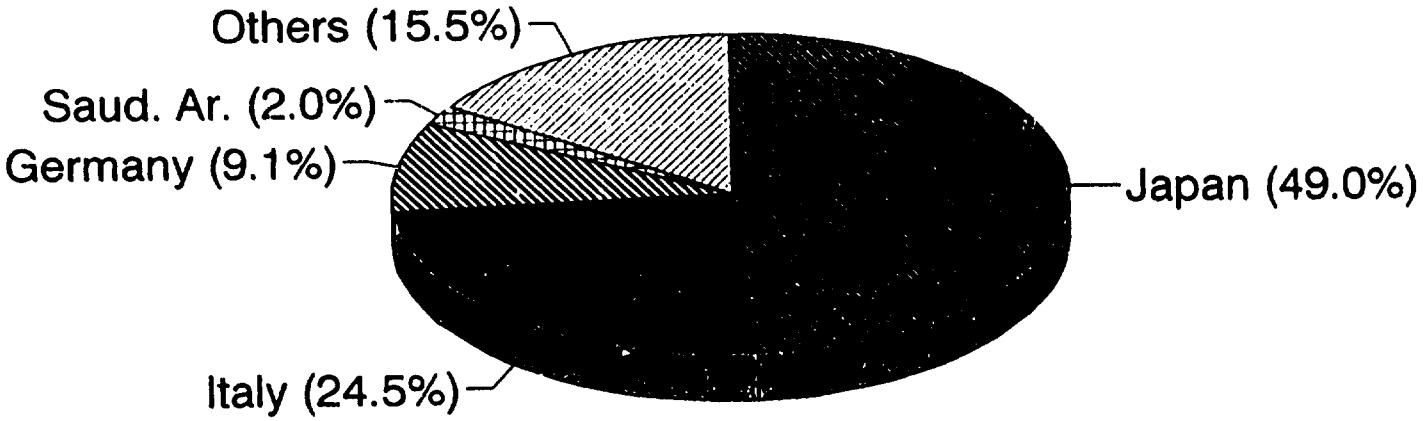
Major Imports of Vehicles



Major Imports of Trucks



Major Imports of Trucks



3.6.3 Users

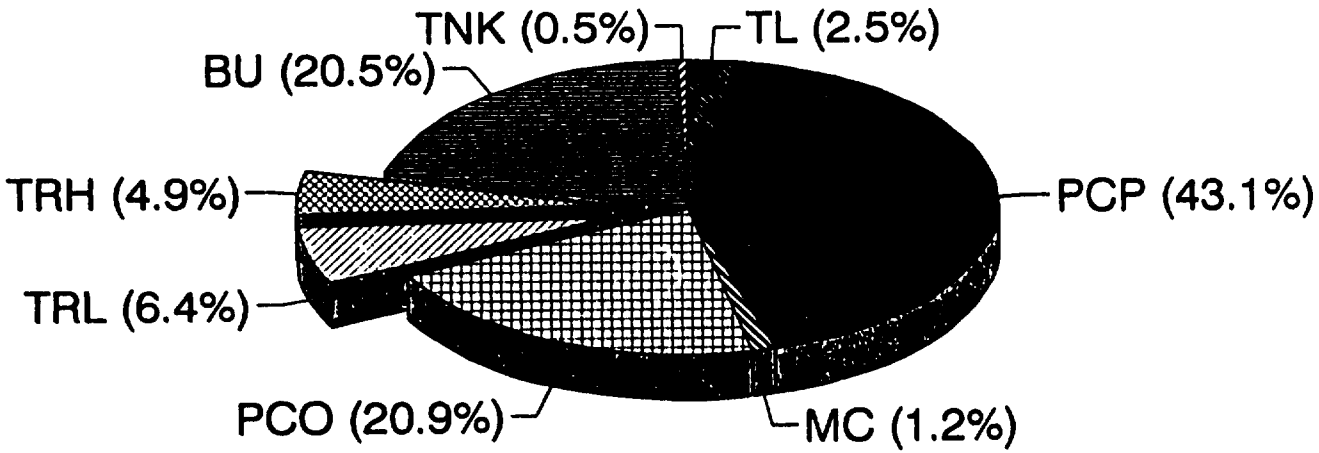
In view of the low degree of development in the region, the main users of road vehicles are state enterprises. Private users are not numerous, and predominate virtually only in passenger cars.

Users, which means also potential buyers, are:
- private individuals
- carriers
- industrial enterprises
- agricultural enterprises
- army
- state administration
- health service
- services
- diplomatic services

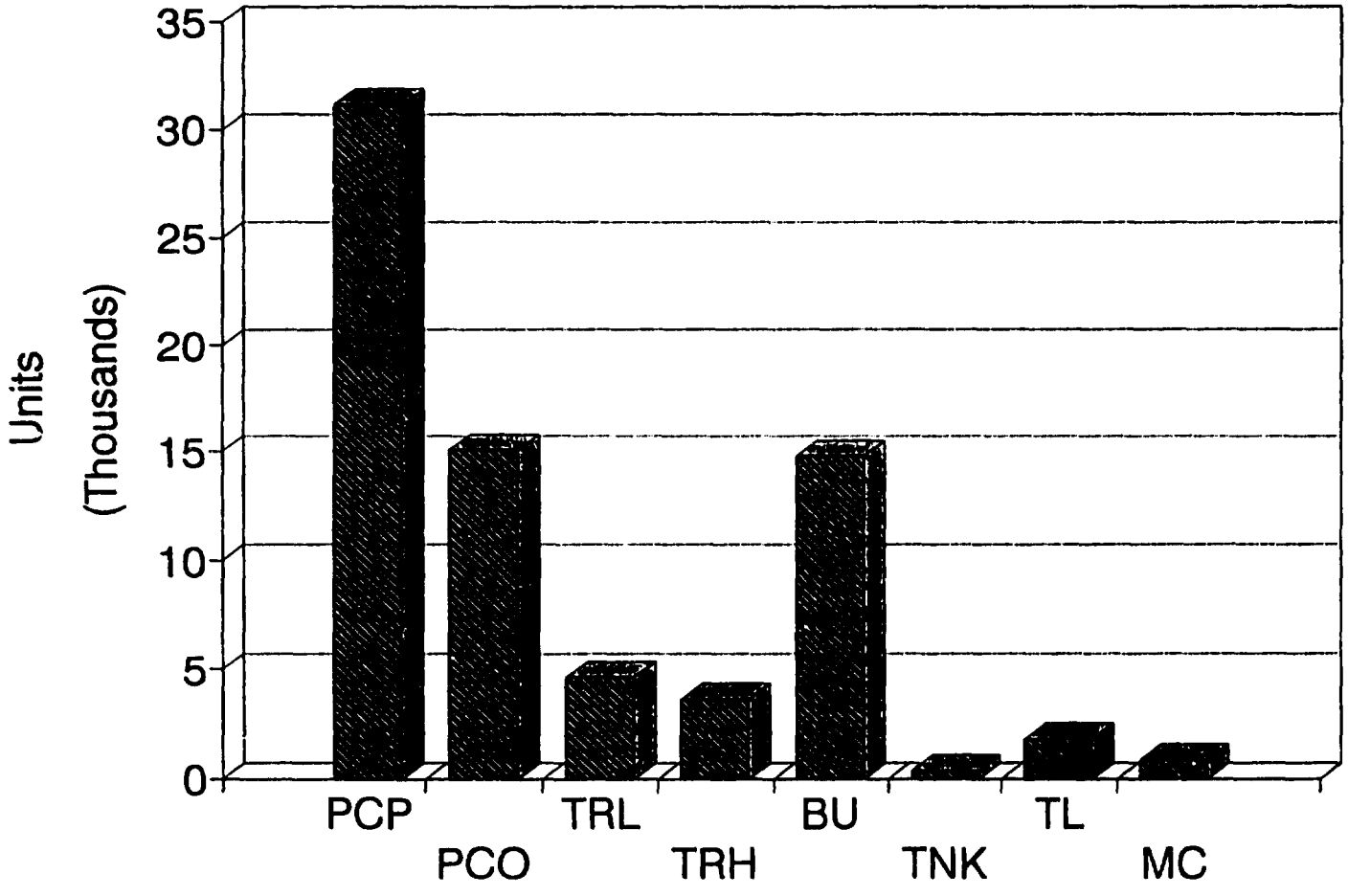
Statistical figures on road vehicles registered in Ethiopia in 1992 are shown, according to categories, in the following graphs.
List of abbreviations:

PCP - privately owned passenger cars
PCO - passenger cars owned by firms,organizations and institutions
TRL - light trucks
TRH - heavy trucks
BU - buses
TNK - tankers
MC - motorcycles
TL - trailers, semi-trailers

Vehicle Registration in Ethiopia (1992)



Vehicle Registrations in Ethiopia (1992)



The biggest carrier in Ethiopia is the state-owned Ethiopian Freight Transport Corporation whose performances in the last three years are tabulated as follows:

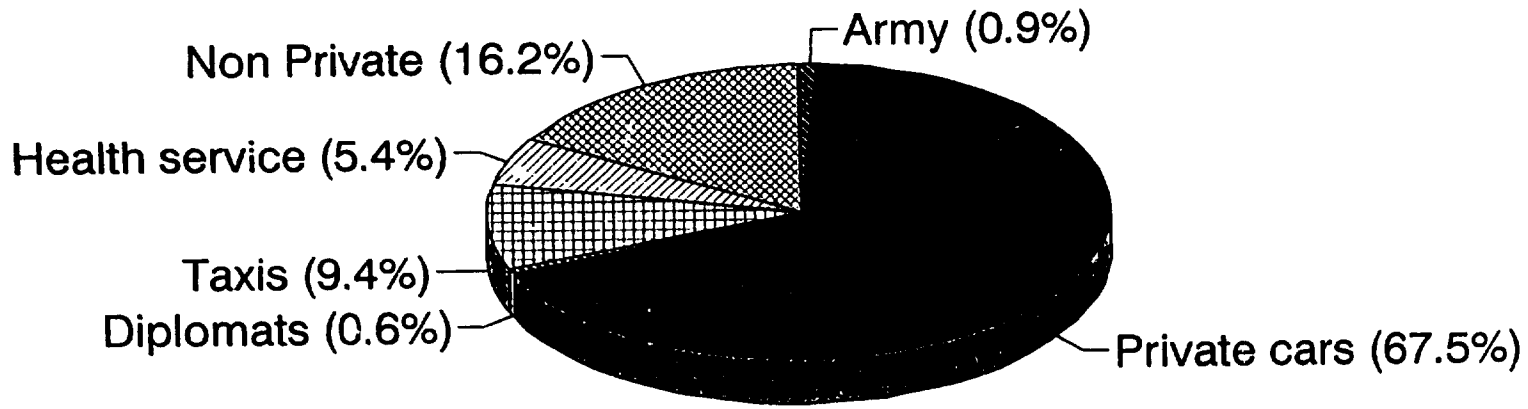
	1990	1991	1992
Operational vehicles	6,256	6,450	6,681
Freight (in 000 tons)	4,613.8	3,884.8	4,587.4
ton/km (in millions)	2,027.7	1,679.9	2,093.6

Privately-owned firms:

	1990	1991	1992
Operational vehicles	865	955	761
Freight (in 000 tons)	766.5	568.7	454.7
ton/km (in millions)	568.1	402.2	326.7

The following graph shows users of passenger cars in 1992:

Passenger Cars in Ethiopia
(1992)



3.7 VEHICLES PRICES

It is very difficult to tabulate prices of various kinds of road vehicles because of non-existence of a market system and unavailability of data. Moreover, prices are evidently not determined by supply and demand but are guided by factors which are difficult to quantify. This causes low stability of average prices in individual categories of vehicles where the spread is considerable.

It has not been possible to obtain data on price trends in the region.

The following table shows prices paid for its vehicles by Ethiopian Freight Transport Corporation.

Model	Purchase	Year	Prices	
			Tractors	Semi-trailers
Fiat 330-30	100	1985	$ 55,320	$ 20,148 CF
Fiat 330-30	100	1986	$ 55,320	$ 17,125 CF
Volvo F 12	105	1986	$ 82,054	$ 28,560 FOB
Fiat 330-36	50	1988	Lira 109.25 mil.	
Fiat 330-30	30	1988	$ 45,360	
Fiat 330-36	25	1989	Lira 123.23 mil.	
DAF 3300	75	1990	DM 136,858	$ 23,943
MACK	95	1992	$ 86,780	$ 24,506 FOB

The following table shows prices of vehicles assembled in the FIAT/IVECO plant in Ethiopia:

Type	Vehicle	Price (Birr)	Price (US $)
180 304	Heavy truck	547,926	109,586
	Construction truck	583,262	116,652
135 174	Mini truck	335,168	67,033
	Mini construction truck	367,759	73,552
E 135.17	Bus	569,017	113,803
E 79.14	Bus	237,817	47,563
	Trailer 7.5m	201,326	40,265

Other statistical figures and prices of vehicles imported to Ethiopia in 1991 are in Annex No. 1. They are, however, not very reliable because sales terms are not known, especially whether the figures apply to new or used cars.

3.8. MARKET REQUIREMENTS, TRENDS

The road vehicles market in the region is clearly far from saturated, in all its segments under review, i.e. in vehicle categories, regions and localities, and in the sphere of market participants.

Non-existent are:
- local production base
- organized distribution network
- repair workshops system

The existing forms of activities on the market are largely haphazard. From the viewpoint of market situation, the various localities are virtually identical. Also the various vehicle categories are represented on the market in very small numbers. This situation is due primarily to the general social and economic level of the region. For this reason, it is useful to divide road vehicles into two main groups according to their use values:

- passenger cars which transport persons
- trucks which carry goods and materials

Whereas passenger cars, with the exception of company cars, can at present be included in the category of luxuries expressive of the living standard of the population, trucks are one of the basic necessities on which the country's economic development depends.

It is obvious that further development of the region is unimaginable without development of the infrastructure. In view of this, it appears useful to consider market requirements with regard to trucks.

Data on freight volumes are further proof that there is a market for trucks in Ethiopia.

ETHIOPIA	1990	1991	1992
Population (in mil.)	51.3	52.9	54.5
Freight (in mil. t)	5,380	4,453	5,042
Ton/km (in mil.)	2,590	2,082	2,420
Number of vehicles	7,121	7,405	7,772
Freight per capita (in tons)	104.9	84.2	92.5
Ton/km per capita	50.5	39.4	44.4
Ton/km per truck (in 000)	363.7	281.2	325.2

There was 0.156 truck for every 1,000 people in 1992.

Comparisons with countries of at least average economic standard show that

- per capita freight is 600-800 times lower
- per capita number of t/km is 25-40 times lower
- number of t/km per 1 truck is 1.5-2 times lower
- per capita number of trucks is 15 - 200 times lower.

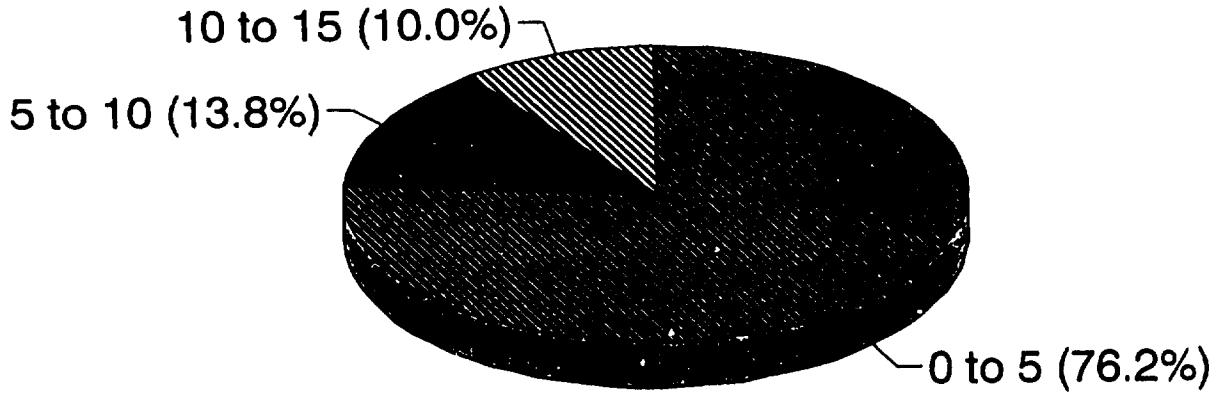
In view of the fact that industry acciunts for a very small part (about 15%) of GNP, its year-to-year growth can be expected to be between 2 and 5%, so that also the volume of freight carried will increase.

Also GNP shows year-to-year increases of about 3%.

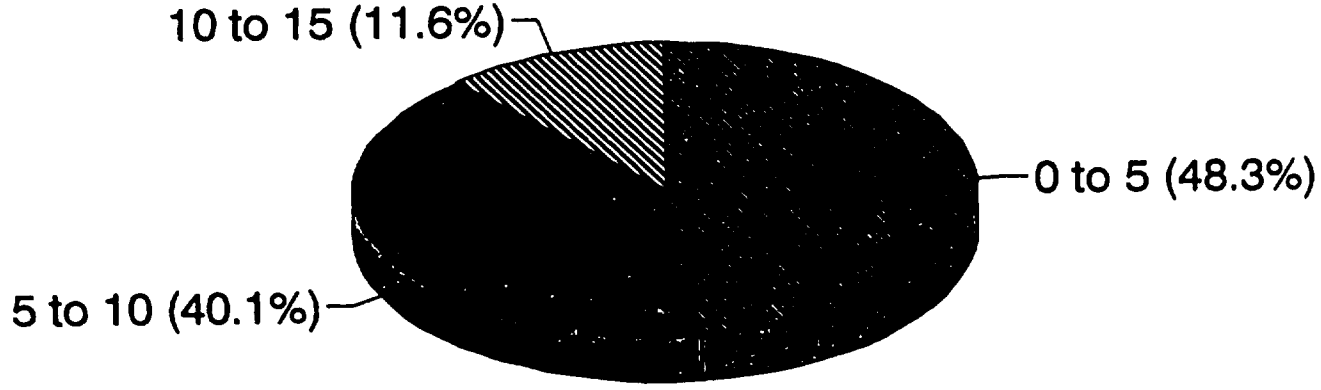
Another factor demonstrating need for vehicles is the high degree of wear of the country's truck fleet.

The following graphs show the structure of trucks by age:

Age of Vehicles (in Years)
Truck under 10t



Age of Vehicles (in Years)
Truck over 10 t



Since the average service life of trucks is 5 years, it is obvious that the actual age structure is unsatisfactory. Also this is a source of future demand on the market.

The need for trucks in the region depends on the following main factors:

- degree of development of the national economic system
- volume of freight carried
- population growth
- degree of wear of existing truck fleet
- degree of development of the region's infrastructure
- potential demand
- service life of vehicles
- political stability

It is very difficult to predict future market trends; the main prerequisite for realistic prognoses is political stability in the country and in the region.

The present economic and social standard is so low that aid from the world community is required, and must be taken into account. Only with foreign aid GNP growth and development of the infrastructure can be expected. The only stable factor appears to be population growth which averages 3.1% in Ethiopia. But this necessitates a higher volume of freight, especially food.

For the coming period, a certain development, not very pronounced, can be expected in the region (provided there is some degree of political stability.) In this connection, also growth of road transport of goods can be safely assumed.

The main tasks in road transport are:

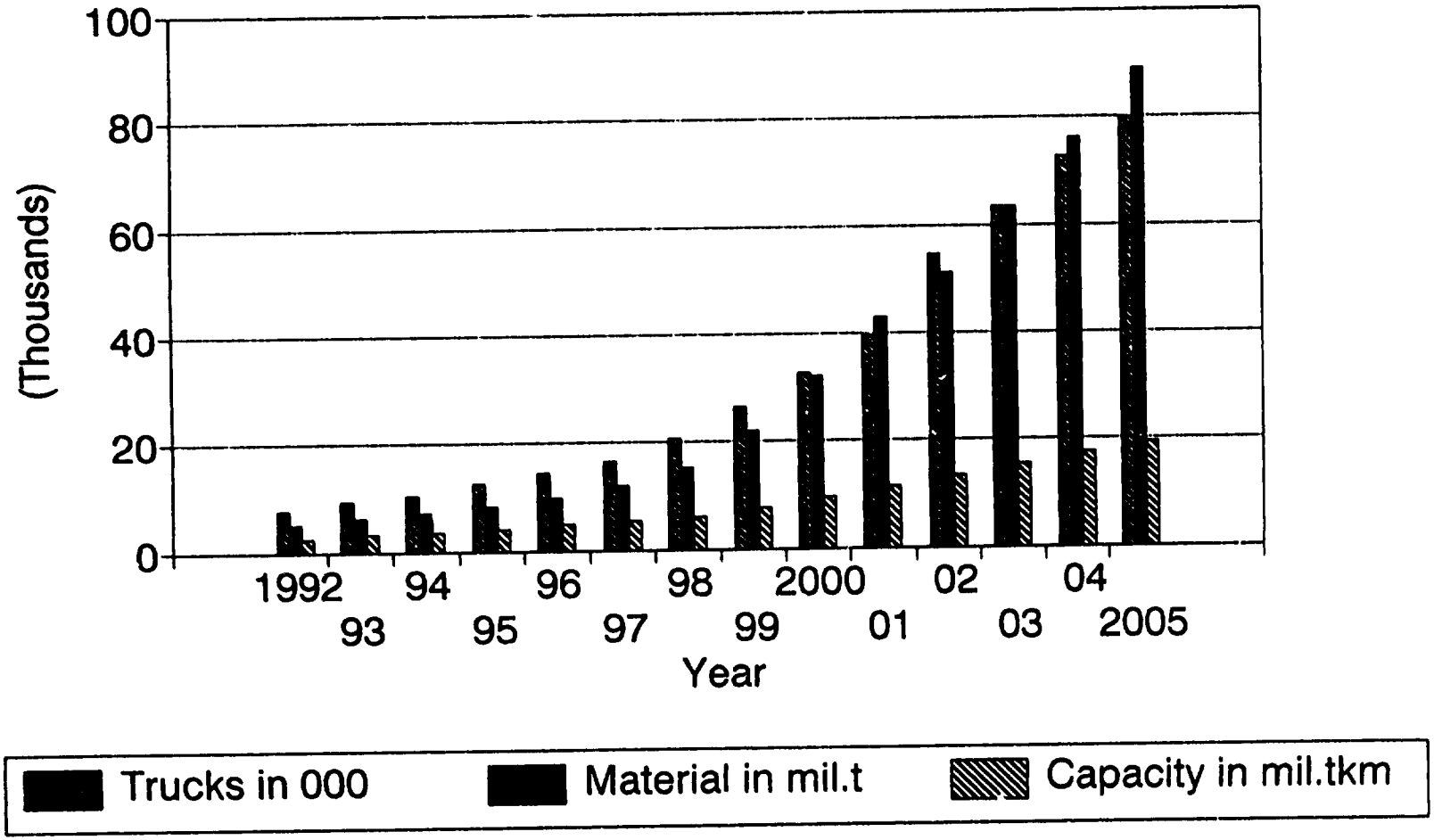
- transport of food
- transport of raw materials
- transport of agricultural products
- transport of building materials

- transport of materials for manufacturing purposes

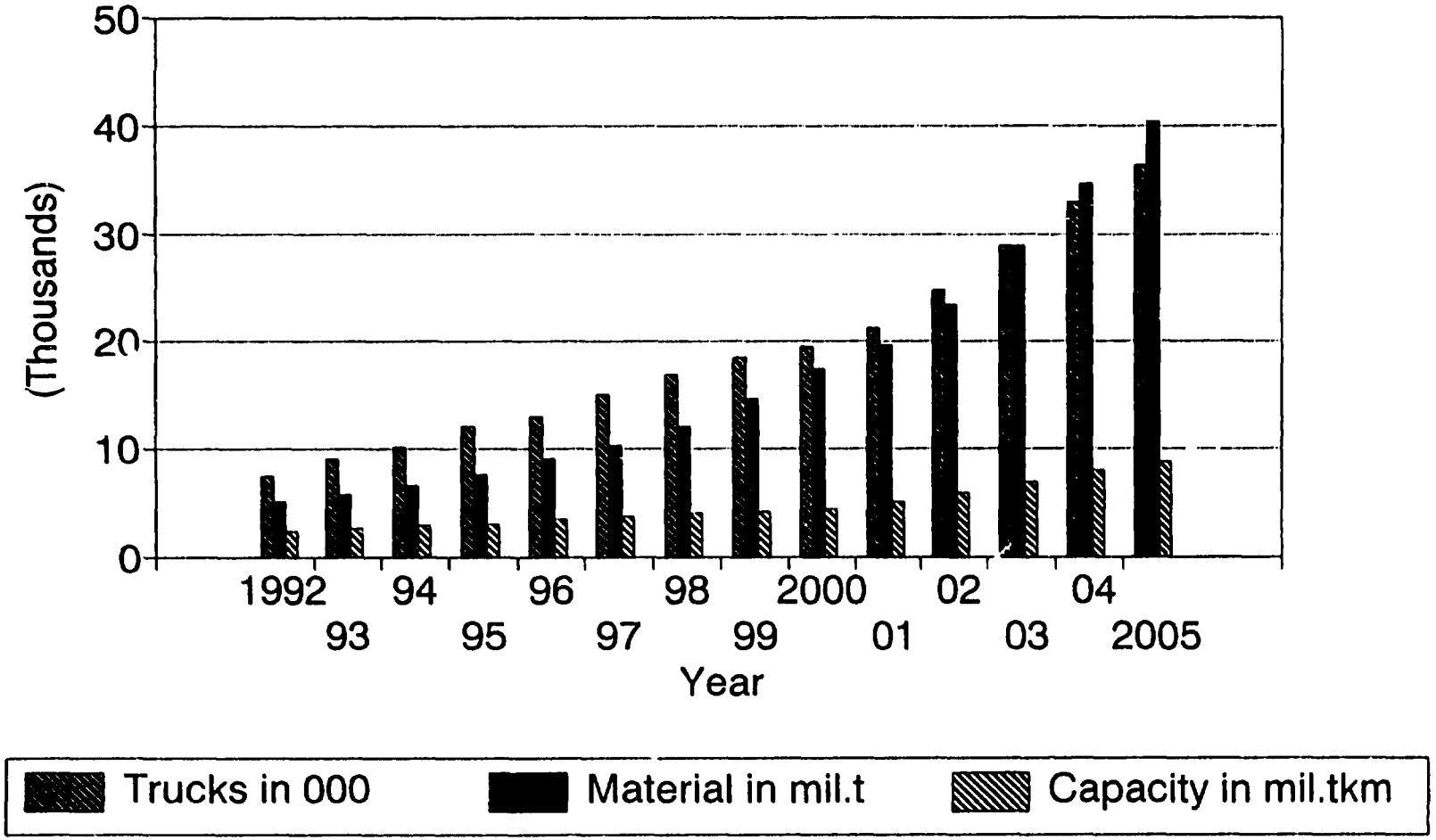
All these commodities can be said to have growth prospects. The following graphs express hypothetical development of Ethiopia's economic system from the viewpoint of factors indicative of the future market demand for trucks. Because of a large number of unknown variables, trend estimates were made in two variants,

- moderately optimistic
- moderately pessimistic.

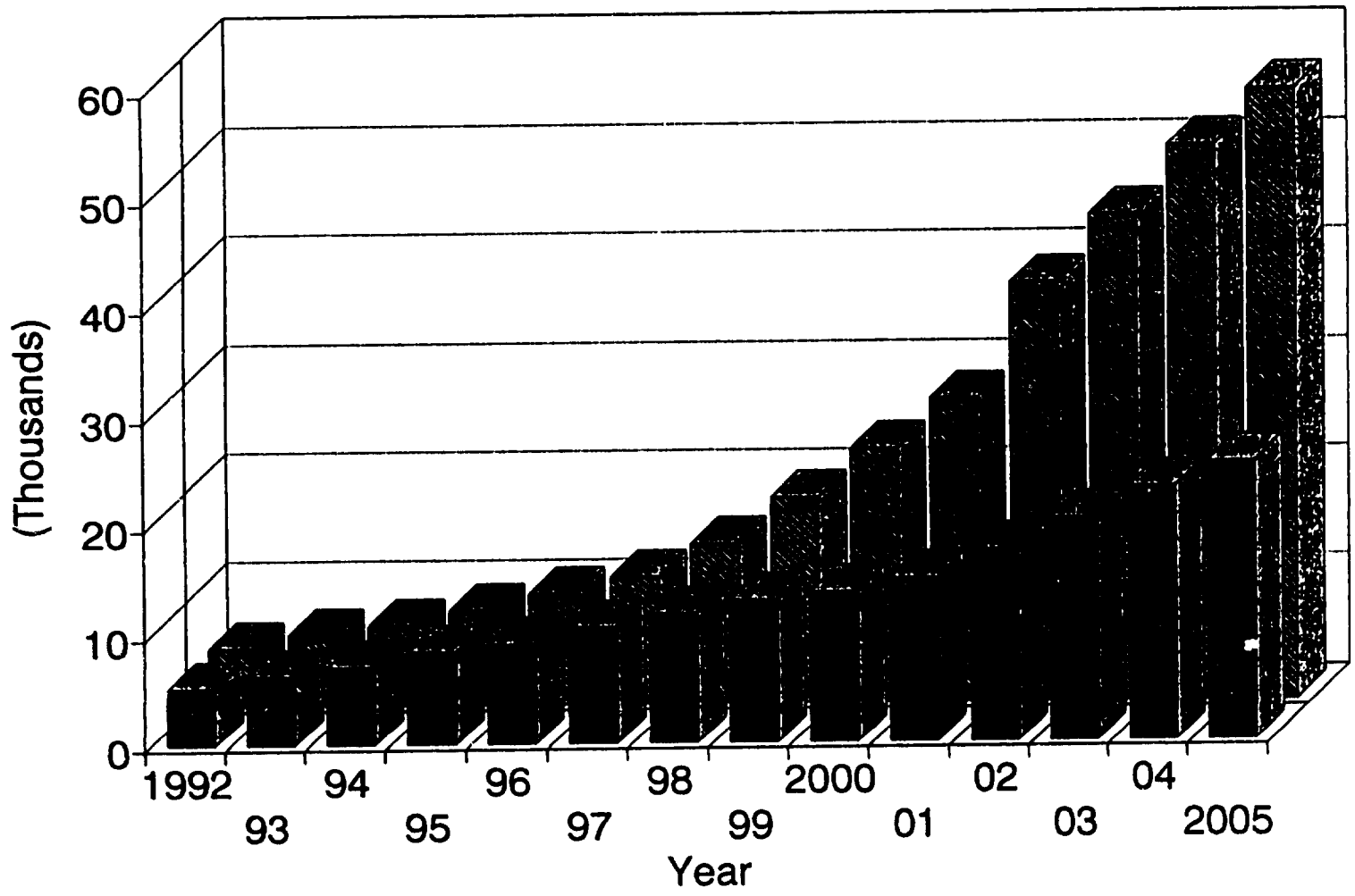
Expected Freightage Trends in Ethiopia
(Optimistic Prognosis)



Expected Freightage Trends in Ethiopia
(Pessimistic Prognosis)



Expected Need for Light Trucks
(Optimistic and Pessimistic)



The trends shown in the graph make it possible to expect the following gradual improvements in road transport indicators:

	1992	2000		2005	
		opti-mistic	pessi-mistic	opti-mistic	pessi-mistic
Freight per capita (in t)	92.5	463.2	251.4	1,100	504.5
t/km per capita	44.4	133.2	64.4	239	108.6
Trucks per 1000 population	0.156	0.472	0.280	0.995	0.452

4. MARKETING STRATEGY

Based on identified data during a research in the region, estimated trends of market consumption in relevant areas and empirical experience, basic drafts of the marketing strategy in the field of the market with road motor vehicles can be formulated.

When creating the strategy, the previous decisions should be respected which are included into this decision-making process as criterial conditions. These are especially:

- decision on the restructuring of the AKAKI Spare Parts and Hand Tools Factory, Ethiopia for production of an unspecified type of motor vehicles;
- to maximize the ratio of domestic production of individual components for production of automobiles;
- to respect the possibility of car exports to the other countries in Eastern Africa, when designing the AKAKI project.

Other significant aspects of the design include:

- proved possibility of realization of cars produced in the AKAKI at the market in the given region;
- technical and investment realism of the designed concept of the AKAKI reconstruction;
- selection of an optimal type of the car for production.

4.1. ALTERNATIVES OF THE SALE PROGRAM

The market demand in the segment of trucks was derived in two alternatives in paragraph 3.8., namely in a pessimistic one and an optimistic one, while passenger cars were not considered due to their minor significance for the economic needs of the country. The demand for passenger cars in the region should be satisfied exclusively by means of imports.

The demand for trucks can be divided as follows by their useful characteristics:

- trucks with loading capacity up to 10 ton;
- trucks with loading capacity over 10 ton;
- trailers.

When deciding on the suitable production line of trucks for the AKAKI, the following aspects are crucial:

- magnitude of the market demand in the given group of cars;
- maximal usability of the existing production machinery;
- flexibility of the production program for the needs of production of other modifications of the basic type.

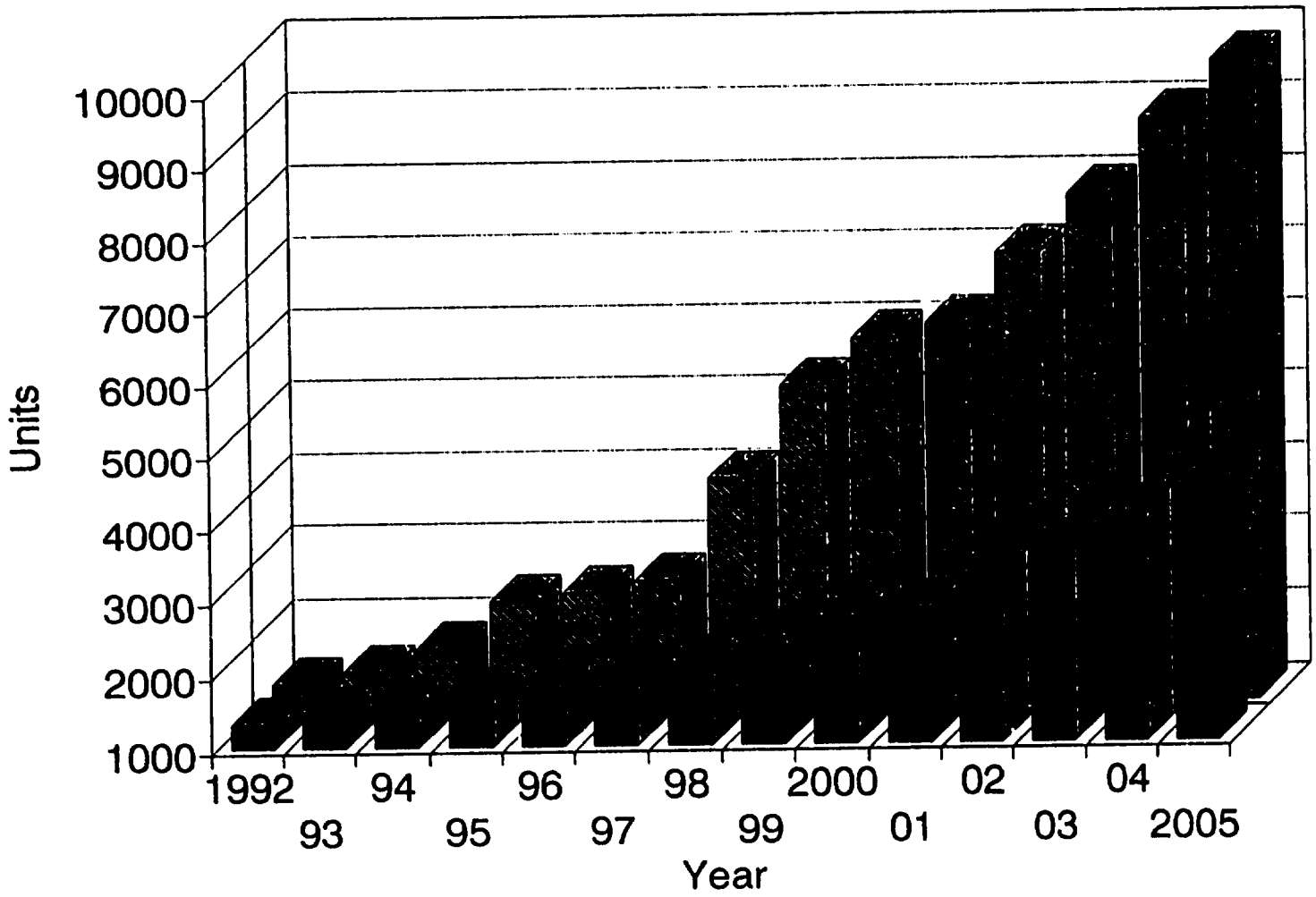
Regarding the magnitude of the market demand, the category of trucks with loading capacity up to 10 ton occupies clearly the first position. The reason is the prevailing kind of goods being transported, the level of roads and, generally, the adaptability to regional conditions.

In addition to that, the basic type of the vehicle can be successfully modified to other useful versions (tank truck, dump truck, trailer, crane, etc.).

The market demand for this type of vehicle is about 70% of the total market demand for trucks.

Respecting the assumptions of the market research in the field of all trucks (see paragraph 3.8), the actual demand for the vehicles up to 10 ton of loading capacity in both alternatives of the development is as follows:

Estimated Annual Light Truck Requirements (Opt. and Pess.)



Therefore, it is evident that the specified volumes of vehicles will have to be ensured at the market. The possibilities are as follows:

- import of vehicles;
- assembly of vehicles in the region from imported components;
- combination of the import of both new and second-hand vehicles;
- production of vehicles in the region;
- combination of production of vehicles in the region and imports.

The disadvantage of imports is the lack of convertible currencies in the region, the advantage is the easy realization providing that a distribution network is created.

The alternative of establishing just an assembly plant of vehicles from imported components is disadvantageous also due to the small disposability of convertible currencies.

This model can be assessed as not successful in the given conditions (compare the FIAT IVECO assembly plant which reaches about 20% of its projected output).

The combination of imports of both new and second-hand vehicles will result in a decrease in the total volume of required funds for the purchase of vehicles, however, the disadvantage of the lack of convertible currencies still persists.

Production of vehicles directly in the region has especially the following advantages:

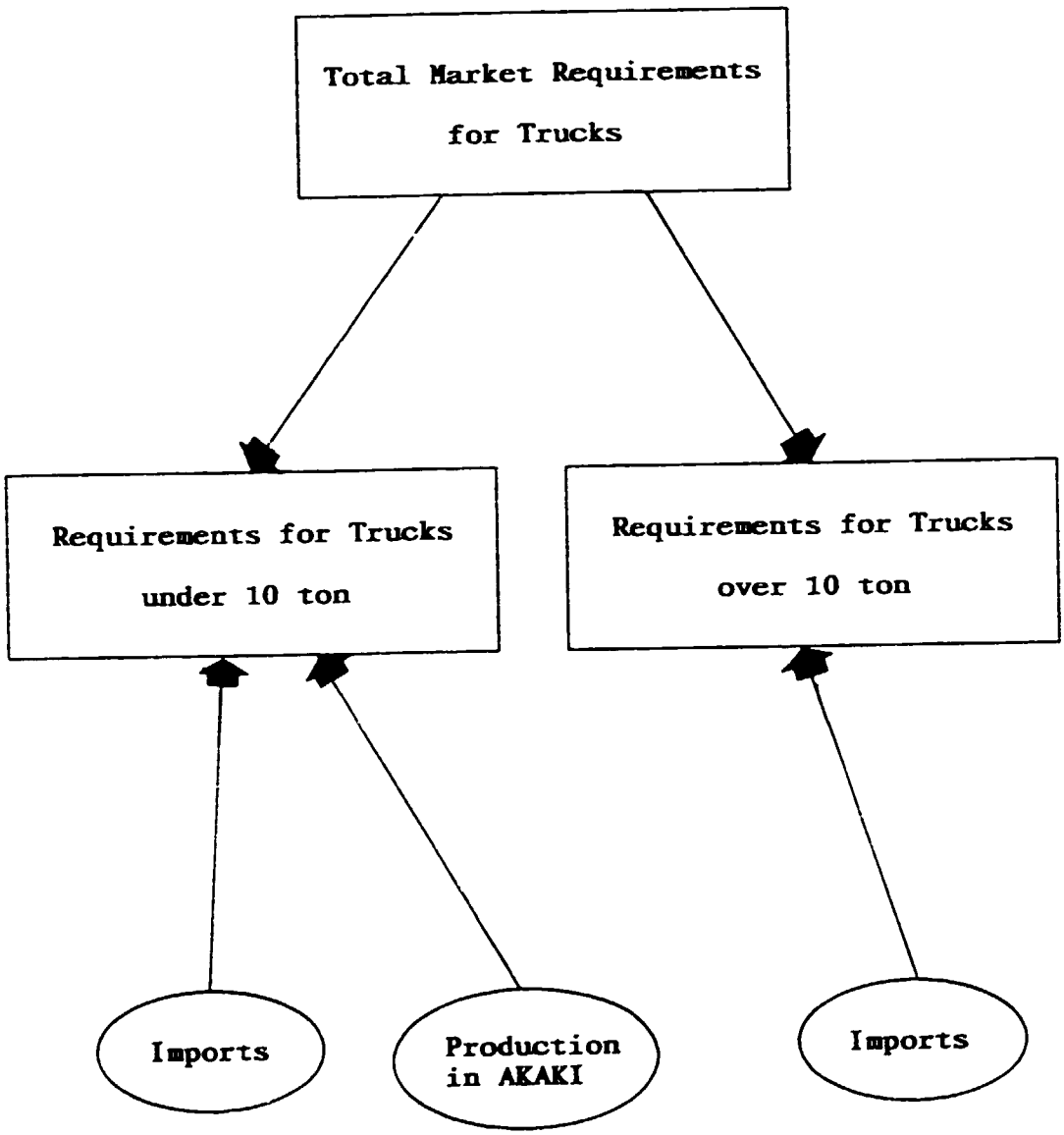
- decreased requirements on convertible currencies;
- creation of jobs;
- integration of domestic and regional suppliers into the production system and subsequent improvement of their production efficiency;
- price accessibility of the final product - truck.

To design the future production factory up to the capacity equalling the projected market demand, however, is very risky, since the activities of the other participants at the market, especially the competitors, should be considered.

Therefore, it is better, regarding the system point of view, to combine own production of vehicles with their imports.

4.2. RECOMMENDED SALE PROGRAM

The alternatives specified in paragraph 4.1 indicate that, regarding the social and economic reasons, the alternative consisting in the combination of production of trucks in the region and their imports according to this model should be preferred under certain conditions.


Total Market Requirements for Trucks
Requirements for Trucks under 10 ton
Requirements for Trucks over 10 ton
Imports
Production in AKAKI
Imports

However, the following aspects are crucial for the designing of a particular strategy:

- determination of the ratio of domestic and regional production and imports in the total market demand;
- price strategy;
- technical and financial feasibility.

Ratio of Domestic Production and Imports in the Total Market Demand

The projected annual demand for trucks with loading capacity up to 10 ton is of an increasing trend, and it is shown at the following diagram (again both for the optimistic and the pessimistic alternatives separately).

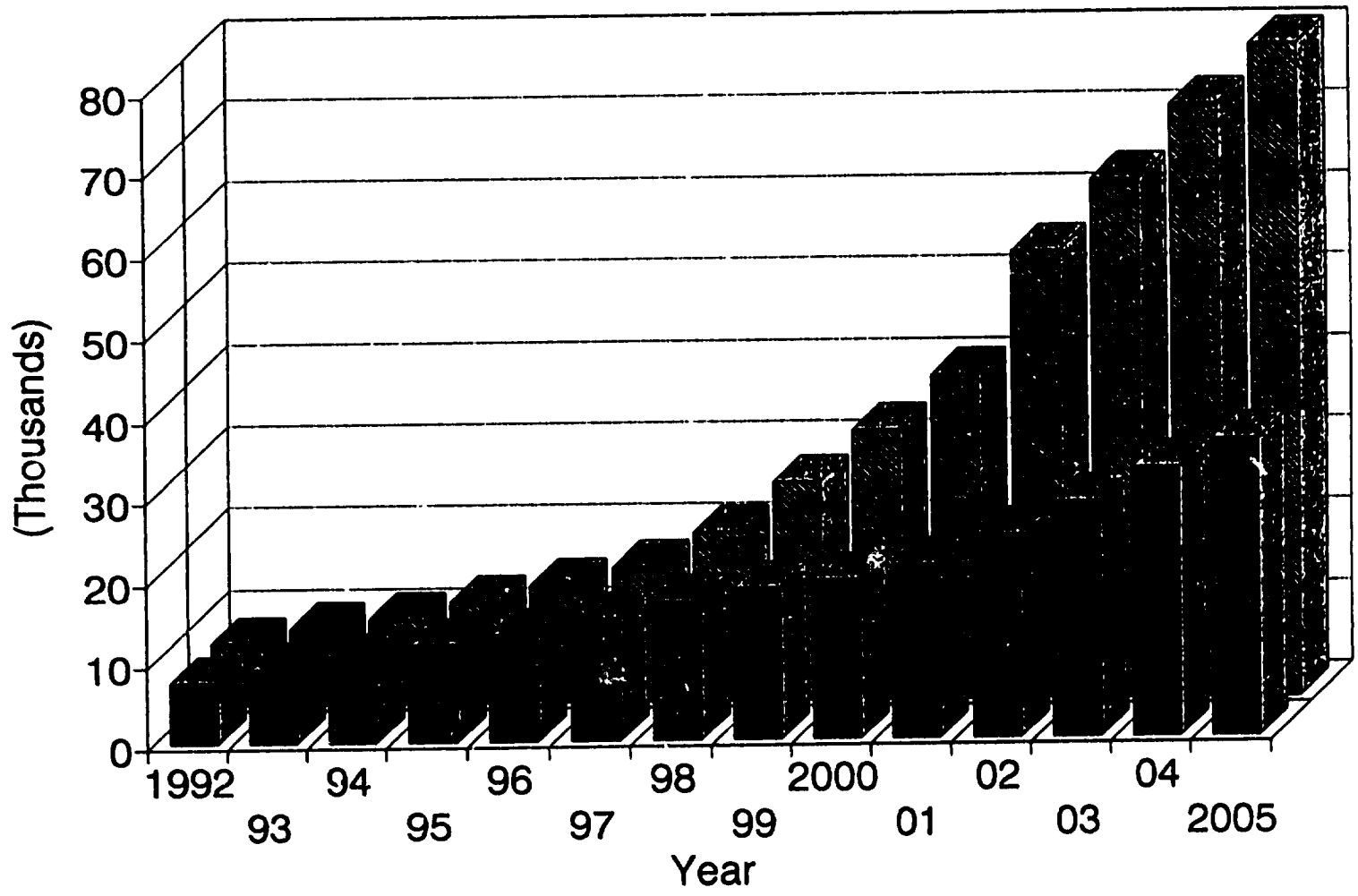
The diagram indicates that the annual demand in the case of the optimistic alternative will grow from approximately 2.5 thousand pieces in 1997 up to 6 thousand in 2000 and 9.5 thousand pieces of trucks in 2005.

If the pessimistic alternative of the demand will occur, the demand in 1997 can be expected to reach 2 thousand pieces, 2.7 thousand pieces in 2000 and 4.5 thousand pieces of trucks with loading capacity up to 10 ton in 2005.

Respecting the situation at the market and the uncertainty factor of projected trends in the market demand, the ratio of own production amounting to approximately 30 up to 50% of the total demand for vehicles of the given line can be realistically considered, with an existing possibility of exports of the vehicles to neighbouring countries in the region.

The remaining market demand will be satisfied by means of imports.

Expected Need for Trucks in Ethiopia (Optimistic and Pessimistic)



Price Strategy

The present prices of trucks at the market are very diversified. however, in principle it can be stated that they range from US$ 75,000 up to 120,000 per piece.

The basic condition for a successful sale of a domestic vehicle is its price accessibility or advantage. Therefore, a price ranging maximally at the lower limit of the above mentioned prices of vehicles at the market should be considered when designing the production system.

The price of the domestic product should then be better by the customs duty of 20% applied to imported goods. The customs duty will be applied to imported components for the vehicle, however, only amounting to 5%.

The projected limit price of the produced vehicle will be:

- for the domestic market	US$	60,850
- for the foreign market	US$	67,900

Technical & Financial Feasibility

The design of the production system is situated in the facilities of the existing AKAKI Spare Parts and Hand Tools Factory with the aim to maximally use the installed machinery and production facilities.

This also determines certain criterial conditions of the technical design.

The ratio of own production in the production of the entire truck is also limited by the realistic conditions of the region. The ratio of own production at the level of maximally 50% can be reasonably projected, providing that suitable components for own

production will be specified.

The problems of the economic feasibility of the design is the subject of an economic analysis subsequent to the technical design. The basic parameters for the analysis include:
- capital expenditure on the restructuring;
- operating costs of the designed production system;
- conditions for the financing of the project;
- price of the product.

In general, the following program of satisfying the market demand for trucks in Ethiopia can be recommended.

VEHICLE TYPE	SATISFYING THE DEMAND
Trucks with loading capacity over 10 ton	imports
Trucks with loading capacity up to 10 ton	30 - 50% production in AKAKI
	50 - 70% imports

The further text includes only the data relating the design of a suitable production system of trucks in the AKAKI.

4.3. DEFINITION OF STATUS QUO IN THE AKAKI

Production System

The plant has been built up for production of spare parts of various mixture and modifications in the forms, dimensions, materials, design and production technique by the requirements of a given application. The plant is designed for the needs of textile production, food-stuff industry, machinery industry, transport sector and expanding agriculture, mining industry and energetics industry.

The major items of the production program in the plant include front gears, bevel wheels, spiral gears, chain wheels, shafts, different types of wheels, cylinders, rotating sets, wedges, levers, balances, springs, steel balls, ingots, brake shoes and drums, pistons for Diesel engines, bearing boxes, frames, stands, casings, gratings, pump bodies, plate cases for chains, various casted and forged parts, hand tools and cutlery.

The production capacity of the plant includes annual production of:

- 3,600 types of different parts of weight about 4,500 ton;
- 1,600,000 pieces of hand tools;
- 600,000 pieces of cutlery.

The plant has its own technical section for the technical consultancy for customers including complete preparation of production.

The plant includes its own foundry for both metal and non-metal materials with capacity of 4,450 ton annually. The foundry also processes nodular cast iron and includes centrifugal casting.

Maximal weight of an iron casting:	10 ton
steel casting:	250 ton
non-ferrous metal:	500 ton

The foundry includes production of wooden models.

Mechanical production is distributed into workshops of:
- turning;
- drilling;
- milling;
- production of gears;
- grinding.

Preparation of materials is distributed into profile materials and plates. A separate building has area of 11,664 m^2, 202 machines including 176 ones for mechanical operations.

Thermal processing enables cementing, malleableizing, annealing, normalizing, removing of stress and induction hardening. Thermo-mechanical devices: carburizing, nitriding and carbo-nitriding under the atmosphere of endothermic gases and ammonia.

The workshop is also fitted with devices for surface induction hardening of, for example, gears up to 300 mm diameter and shafts up to 60 mm diameter and 1000 mm length.
The forge - a separate building for smith forging and drop forging.

Maximal weight of:	a drop forging	40 kg
	a forged piece	450 kg

The plating shop - integrated into the building of mechanical production. It is fitted with a line for chrome, nickel and phosphate plating. The shop includes machines for buffing for cutlery, continual degreasing machine, varnishing chamber and conservation.

The quality control is ensured by the laboratories located in each production building.

The plant employs 600 workers, with the projected growth up to 900 workers.

Regarding the character of production, the organization arrangement is based on individual techniques.

Structure of machinery:

- turning 34%;
- plane processing 35%;
- gearing 8%;
- drilling 24%;
- grinding 9%.

The structure of machinery indicates an unusually high ratio of the machines for rotation processing compared with the machines for plane processing on cutters and especially plane grinders.

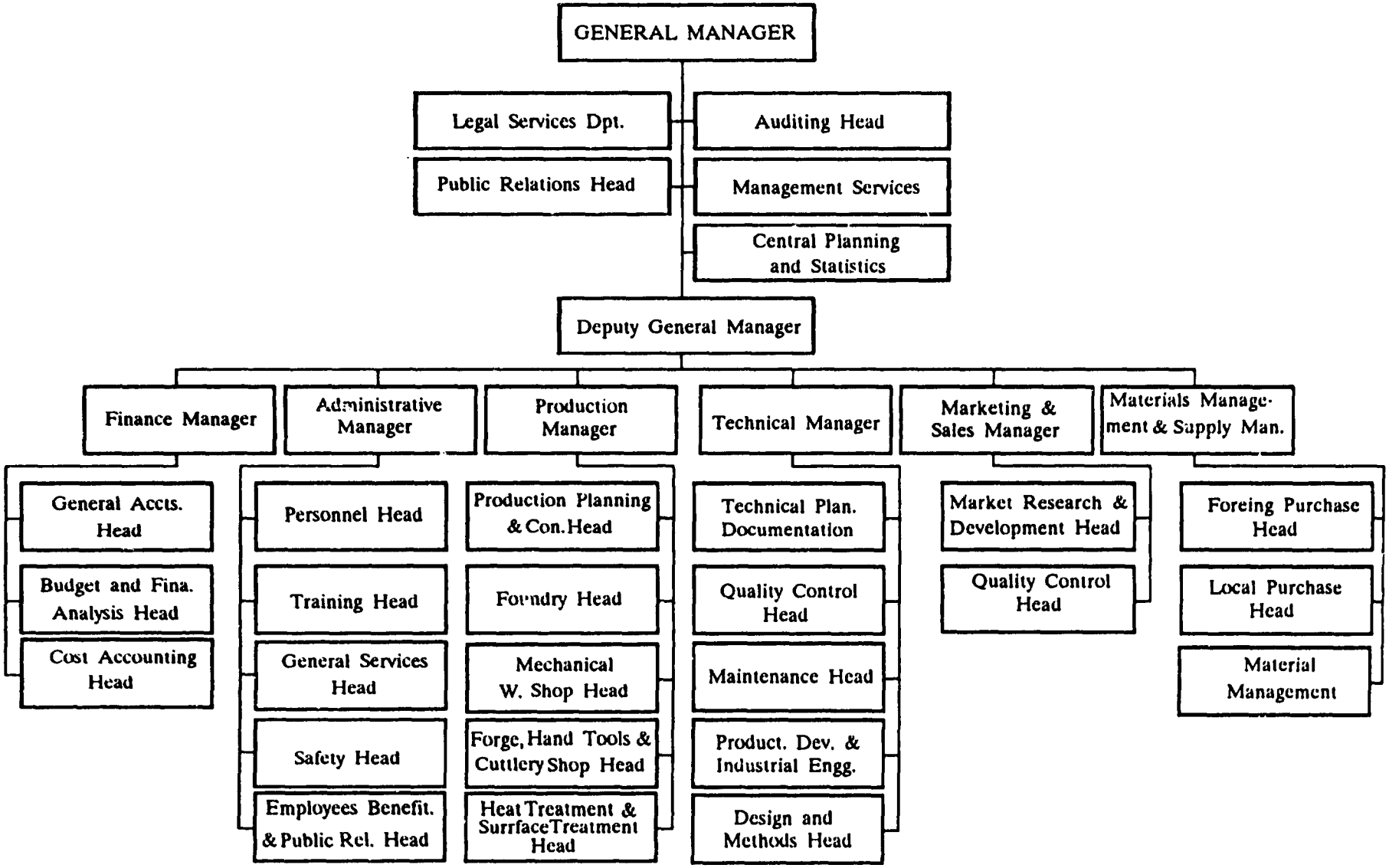
To ensure profitability of production for about 20 machines for large products, designed for production of spare parts, also seems to be very difficult. In this context the capacity of the foundry is quite high regarding the proper production of parts.

Working mode:
One day shift - eight hours with 30 minutes of noon break.

Qualification of workers:
80% - skilled workers
20% - without qualification.

Qualification of technical & administration workers:
Good theoretical level plus corresponding practical experience for performed functions.

The organizational structure of the plant is as follows:


GENERAL MANAGER
Legal Services Dpt.
Auditing Head
Public Relations Head
Management Services
Central Planning and Statistics
Deputy General Manager
Finance Manager
Administrative Manager
Production Manager
Technical Manager
Marketing & Sales Manager
Materials Management & Supply Man.
General Accts. Head
Budget and Fina. Analysis Head
Cost Accounting Head
Personnel Head
Training Head
General Services Head
Safety Head
Employees Benefit. & Public Rel. Head
Production Planning & Con. Head
Foundry Head
Mechanical W. Shop Head
Forge, Hand Tools & Cuttlery Shop Head
Heat Treatment & SurrfaceTreatment Head
Technical Plan. Documentation
Quality Control Head
Maintenance Head
Product. Dev. & Industrial Engg.
Design and Methods Head
Market Research & Development Head
Quality Control Head
Foreing Purchase Head
Local Purchase Head
Material Management

Energetics & Auxiliary Systems

Electric Power

The AKAKI plant is supplied with electric power from a 45 kV system. There is a 45 kV substation with 45/15 kV transformation in the plant. Two 45/15 kV - 6 MVA transformers are installed, third transformer can be installed at a constructionally prepared site.

The 15 kV switching station is indoor type and feeds 15 kV distribution lines supplying distribution transformer stations located in the building of the foundry and in the building of mechanical operations (Buildings No. 4 and 5). The transformer station in the building No. 5 also feeds the remaining buildings with low voltage of 400 V.

Dimensioning of the existing transformer stations and distributions is sufficient for the operations in the existing part of the plant, the input 45/15 kV transformer station will cover the considered expansion after its refitting.

Thermal Power

Regarding the climatic conditions, the buildings in the plant do not have to be heated. Heating of service water for hygienic purposes is ensured using electric power, heating in the kitchen is performed by means of LPG supplied in cylinders.

Pressure Air

The compressor station is fitted with three compressors of total output amounting to 4,498 cubic meters per hour, pressure of 0.7

MPa. The compressor station is sufficient to cover the mechanical operations, foundry, forge and hardening shop.

Water Systems

The AKAKI plant is supplied with water from its own resources, i.e. from two wells with yield of 23.4 cubic meters per hour each. At present only one well is used, which is fully sufficient to cover the consumption in the whole plant, both for the hygienical and for the industrial purposes. Water is treated in the treatment plant and quality of treated water was verified by one taken sample which was analyzed in an authorized laboratory - see Protocol No. 868/1993 dated on May 6, 1993. Quality of water is acceptable.

The existing delivery of water from the treatment plant is 5" in diameter, and another water distribution round the main production building is fed in the tubing of 4" + 21/2" in diameter.

Sewerage in the Plant and Treatment of Vaste Vater

Sewerage in the AKAKI plant is constructed in the direction of the terrain slope of the entire area. Sewage water is discharged on the surface by means of dugouts with gradient along the terrain. Sewage and treated waste water is discharged in tubing outside the plant where this waste water is liquidated.

Territorial and Constructional Design

a) Urbanistic Design of the Existing Buildings:

The plant is designed according to urbanistic principles of zone distribution of production plant areas, so that the buildings of the pre-plant and hygienic character are separated from the production buildings which form a zone of buildings of same depth (110 m). Auxiliary smaller buildings form a third zone of storage, additional and energetics buildings. The entry and reception gate are at present situated quite excentrically, since a further development of the plant was most probably expected, namely in the south-east direction. A free area between the hygienic and administration buildings and the production halls will make it possible to expand them in this direction, the concept of the same width of the zone of production halls will make it possible to expand the halls, if necessary, to the free areas between each other to form a mono-block.

All these possibilities of development of all areas, respecting the already designed zones, prove the correct and optimal foundation of the plant. The terrain rise in the north-east direction is just a small obstacle for the expansion of areas, however, it should be considered.

The new construction relating the designed production will therefore be, in compliance with the general plan, at the lot situated in the south-east direction which is free, not built up and without growth. The existing zones will be maintained as well as the construction design of the buildings so that the plant creates a unified architectonic unit.

b) Construction & Architectonic Design of the Existing Buildings:

The buildings are of industrial character, designed in a very simple way from the mass point of view. The interesting appearance of the hygienic and administration zone results from its positioning towards the road and the production halls. The buildings are mostly single-floor steel structures with light casing made of a metal sandwich-type case. The administration buildings No. 1 and 3 are two- and three-floor buildings respectively. The buildings are founded on concrete foundations. the roof casings are with light wells, the bands of simple windows combined with trapezoid plates in main buildings form a calm and well-arranged impression, which is also the aim of the new construction regarding the architectonic design.

Conclusion:

The plant produces spare parts and components according to individual orders of customers in the form of piece production, mostly without technical documentation. The supply terms are very long, selling prices high. Auxiliary production of cutlery and manual tools features problems in the field of sales.

From both the construction and energetics point of view, the plant is suitable for the reconstruction to production of trucks. The existing production program is planned to be maintained.

Utilization of the plant	15 - 20%
Start of operation	1989
Capital expenditure on construction	US$ 52,512,000
Present value	Birr 92 mil,
	i.e. US$ 18.4 mil.

The production and operating costs are specified in the Appendix No. 1.

4.4. VARIANTS OF THE AKAKI RESTRUCTURING

The limiting factor of realistic variants for the expansion of the AKAKI plant is the sub-system of the mechanical machining shop. The design should be logically based on this fact, since in case it is not respected practically all existing systems would have to be expanded both technically and constructionally, and in such a case it would be cheaper to build up a brand new plant.

Regarding production of final products, the realistic market demand is naturally another limiting factor in addition to the size of the mechanical workshop.

Using the assumptions stated in preceding paragraphs, a range of reasonable annual production in the plant can be set up around 1,500 up to 5,000 trucks.

Thus this range becomes a basis for the formulation of realistic variants for the expansion of the AKAKI plant for production of trucks. The final design is naturally preconditioned by compliance with the criterium of economic effectivity.

Based on the above mentioned facts, the following variants for the expansion of the plant can be formulated:

VARIANT 1 - production of trucks with loading capacity up to 10 ton in the annual volume amounting to 3000 pieces, in a single-shift working mode.

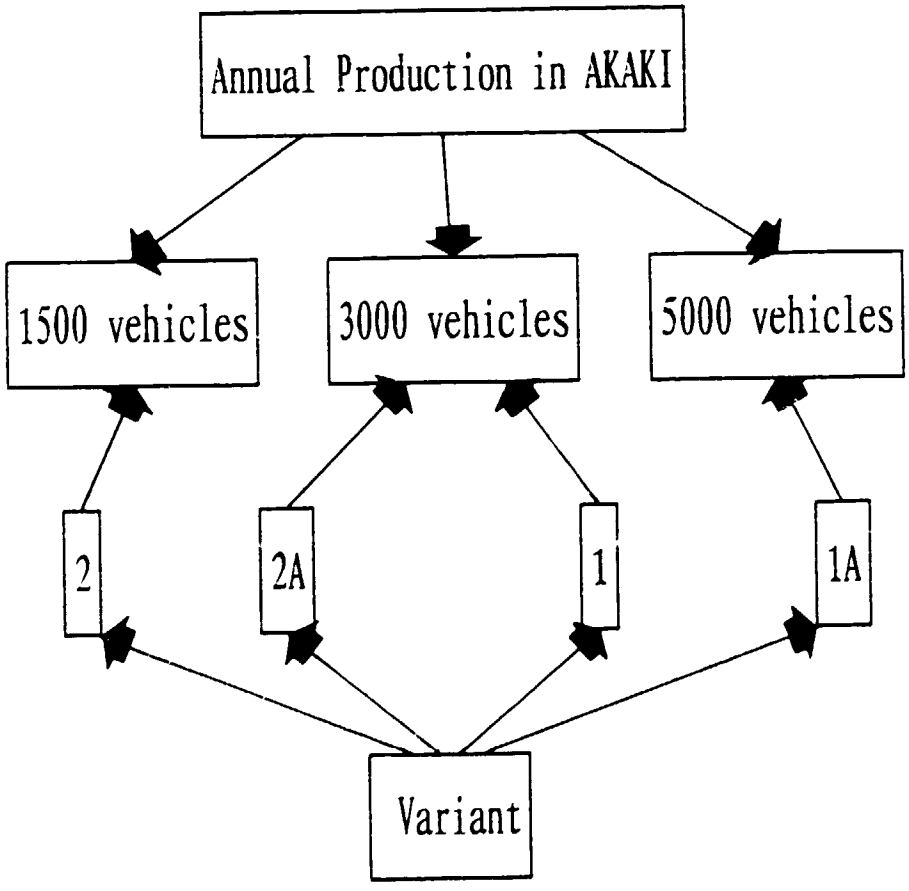
VARIANT 1A - production of trucks with loading capacity up to 10 ton in the annual volume amounting to 5000 pieces, in a two-shift working mode.

VARIANT 2 - production of trucks with loading capacity up to 10 ton in the annual volume amounting to 1500 pieces, in a single-shift working mode.

VARIANT 2A - production of trucks with loading capacity up to 10 ton in the annual volume amounting to 3000 pieces, in a two-shift working mode.

The set of usable variants was selected to cover the entire projected range of the domestic production volume, and variants considering a two-shift utilization of the production machinery (Variant 1A and Variant 2A) were evaluated for both basic modifications (Variant 1, Variant 2) projected always with the time fund corresponding to one shift.

The designed variants can be synoptically shown as follows:



5. PROGRAM OF RESOURCES FOR PRODUCTION

The data mentioned in paragraph 7.1. indicate that approximately 50% volume of own production of components required for the final product is projected.

The basic material resources are various primary products of metal, that means metallurgical materials. Based on a research performed in Ethiopia, mainly domestic supplies of these materials can be expected, the same applies to the supplies of materials for upholstering and sheets for the loading compartment of vehicles. The oil products (lubricating oils and greases, fuel) will also be supplied from Ethiopia.

The following production companies in the region can be expected to supply sub-products:

ADDIS TYRE COMPANY:
production of tyres, inner tubes and selected rubber parts.

ADDIS CAR BATTERIES:
production of batteries.

ELECTRICAL MACHINERY FACTORY:
production of starters after putting into operation.

MARU TEFRA CENTRAL METAL WORKS:
selected parts for the body and platform, special modifications, in a limited volume.

ETHIOPIAN FREIGHT TRANSPORT CORPORATION - E.F.T.C.
selected mechanical parts
providing of the service and repair network in the region.

PUBLIC TRANSPORT CORPORATION:
selected mechanical parts and components
providing of a partial repair and service network in the region

The following production companies in the other countries of the region can be expected for possible cooperation at the project:

TANZANIA:

STATE MOTOR CORPORATION:
selected mechanical parts

AFRO COOLING SYSTEM Ltd.:
production of radiators.

TANZANIA AUTO PART Ltd.:
production of filters and exhausts.

TANZANIA SPRING INDUSTRIES AND AUTO PARTS Ltd.
production of leaf and spiral springs
air and oil filters
bulbs.

MOUNT CARMEL RUBBER FACTORY:
rubber parts
plastic products.

KENYA:

KENYA VEHICLE MANUFACTURES Ltd. THIKA:
absorbers
brake shoes
radiators
batteries.

H. YOUNG & Co. - E.A. - Ltd. NAIROBI:
modifications of vehicles - dump trucks, towing vehicles.

BURNTS AND BLANE ENGINEERING NAIROBI:
radiators.

AUTOFILTERS Ltd.:
air filters
oil filters.

R.B. SHV-AFRICA-Ltd.:
brake lining.

AUTO SPRING MANUFACTURERS Ltd. ATHI RIVER:
leaf springs.

ALLOY STEEL CASTING Ltd.:
complex mechanical parts (gears, etc.).

ZAMBIA:

CONSOLIDATED TYRE SERVICES LIMITED KITWE:
rubber parts, silent-blocks.

6. LOCATION, SITE AND ENVIRONMENT

6.1. PLANT LOCATION

The plant is situated ca. 2,000 m above sea level, northeast of Addis Ababa, 25 km from the city, about 200 m from the highway linking Addis Ababa with the port of Assat.

The location of the plant in slightly undulating terrain and free surrounding area make possible its extension in all directions.

6.2. LOCAL CONDITIONS

The plant is accessible by the above-mentioned highway Addis Ababa - Assab. From the port of Assab, about 850 km distant, the main supplies for the plant will be transported by road vehicles. Another possibility is by railway from the port of Djibouti. The railway line Addis Ababa - Djibouti runs near the plant. Therefore, the building of a siding to the plant can be considered.

Energy supply is adequate. A 45 kV system supplies the plant where this voltage is transformed to 15 kV for the internal distribution system.

The whole system is sufficiently dimensioned and makes further increase in output possible.

Water is drawn from own wells whose yield is sufficient also for further extension. The water used in the plant is classified as potable.

Technical gases necessary for operations are delivered in cylinders.

About 80% of the work force are qualified workers who can be expected to learn fast the new skills during the introduction of the new production program. The location of the plant near the capital makes it possible to assume that further labour could be hired. The quality of the techno-economic employees is on a good theoretical level, and they have adequate practical experience.

The climatic conditions are very favourable. Maximum night-time temperatures average 5-10^{0}C, maximum daytime temperatures range from 20 to 25^{0}C. Precipitation is lowest in the winter months when rainfall is measured in tens of millimeters; in the summer months, up to 30 mm. Rains tend to be short and copious.

6.3 EFFECT OF THE PROJECTED PRODUCTION SYSTEM ON THE ENVIRONMENT

The projected engineering production would not have a negative impact on the environment, from ecological viewpoint . A part of the scrap can be recycled for further processing, a part will have to be disposed of outside the plant. Polluted industrial water will be treated in the plant. An effective filtering system will reduce emissions from the paint shop to the minimum.

The new production program will make it possible to make use of free capacity, with the share of existing production maintained. Moreover, it will create about 600 jobs which will increase employment. The very favourable infrastructure will make it possible to utilize material resources and available labour. Production of road vehicles with a high share of domestic manufacture will have a very positive effect on the transport situation in the country. Also the economic effect will not be negligible.

7. ENGINEERING SITUATION AND TECHNOLOGY

LEGEND

1 Administration BLG
2 Social Services
3 Technical Office
4 Foundry
5 Mechanical Workshop
6 Finished Parts Store-House
7 Vehicle Maintenance Garage
8 Heat Treatment
9 Forge
10 Water treatment
11 Store-House for Combustible Materials
12 Electric Sub-Station
13 Weight Bridge
14 Gate Reception
17 Water Well
18 LPG Storage
19 Piezometric Tower
20 Fuel Storage

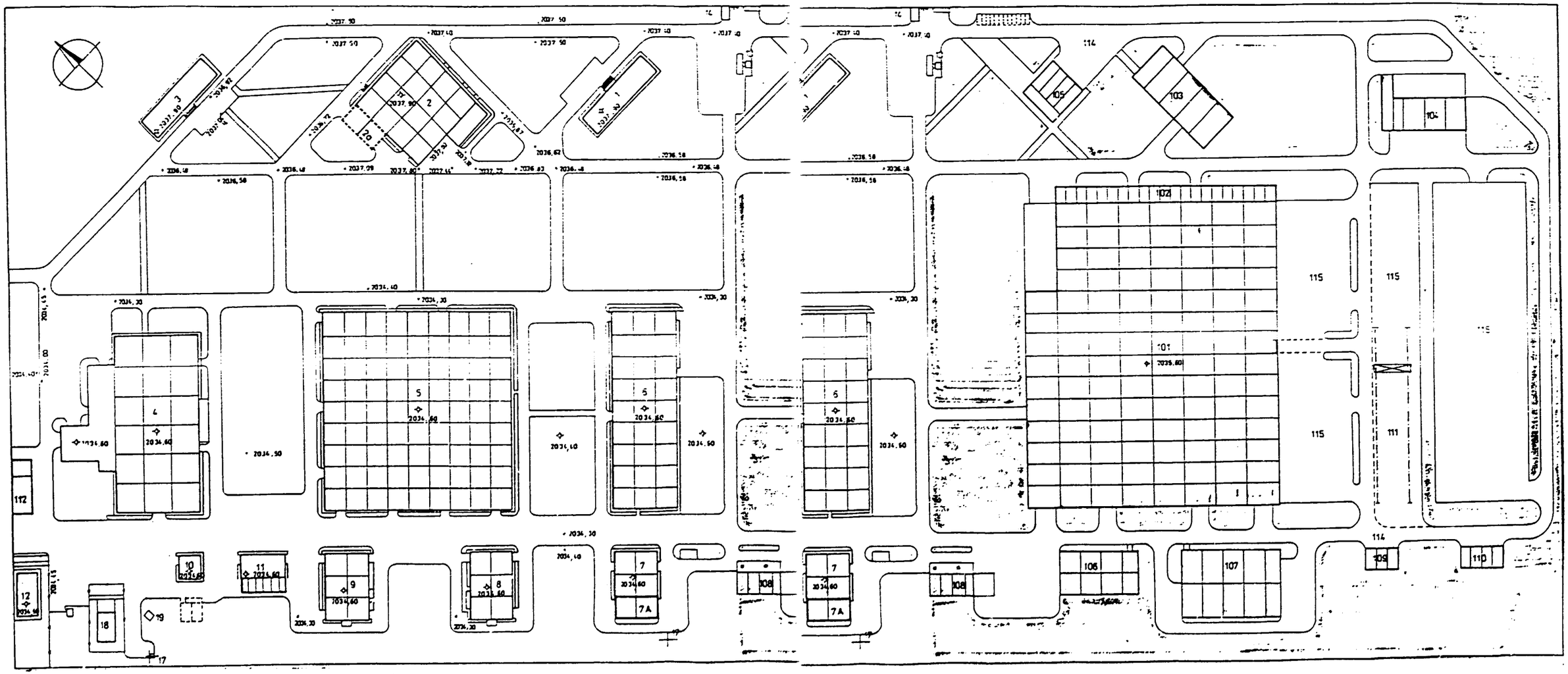
New Building

2A Social facility extension
7A Extension of garages and maintenance shop
101 Body and assembly workshop
102 Annex to social and operations facility
103 Manufacture of electrical installations, upholstery shop
104 "Repase"
105 Vehicles delivery hall
106 Central maintenance workshop
107 Tyre storage
108 Fuels and oil storage
109 Compressor station
110 Gas storage
111 Outdoor storage
112 Scrap dump

ROAD VEHICLE PRODUCTION AKAKI

Variant 1, 1A

Lay-out



LEGEND

1 Administration BLG
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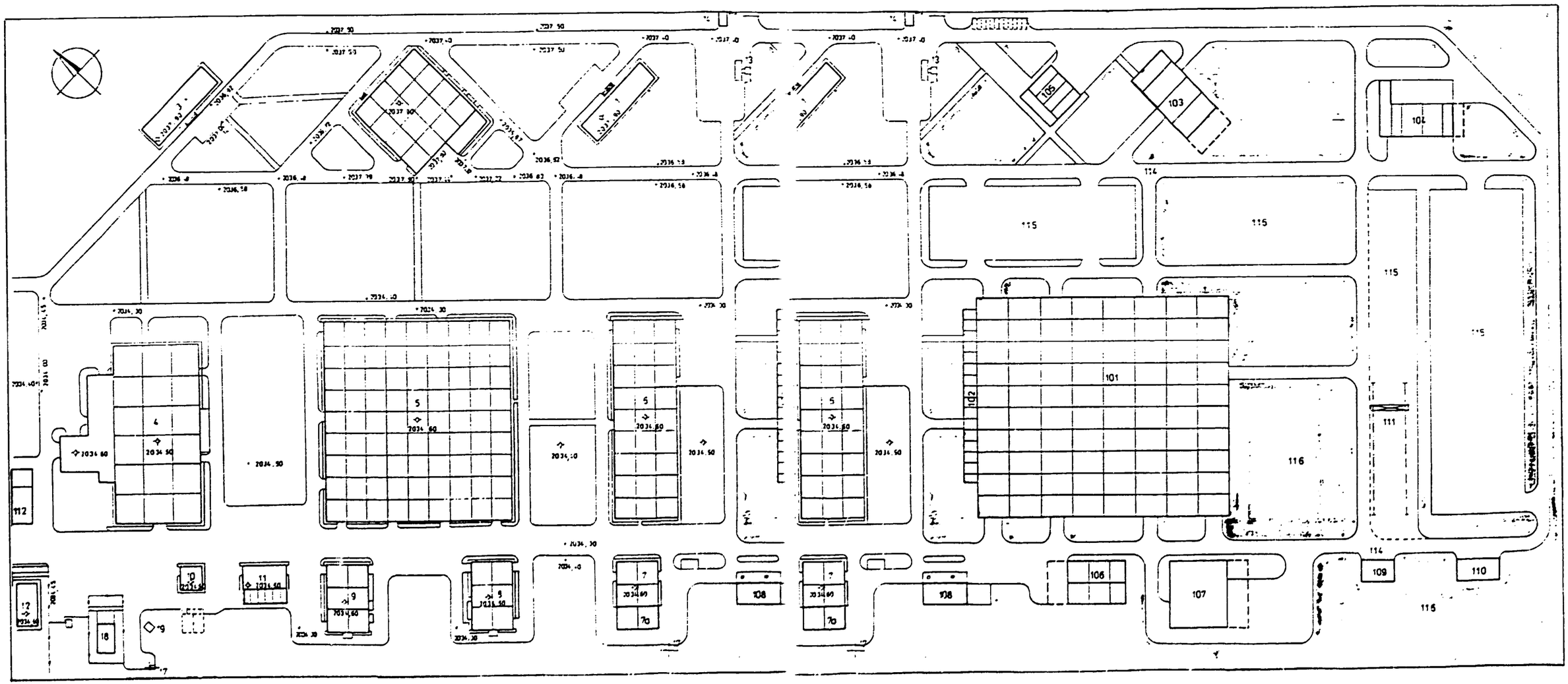
105 Vehicles delivery hall
106 Central maintenance workshop
107 Tyre storage
108 Fuels and oil storage
109 Compressor station
110 Gas storage
111 Outdoor storage
112 Scrap dump

ROAD VEHICLE PRODUCTION AKAKI

Variant 2, 2A

Lay-out



SECTION 1

SECTION 2

Scale 1:2000

7.1. PRODUCTION PROGRAM

A representative of the product - truck with loading capacity up to 10 ton, has been defined due to the reasons specified in preceding paragraphs. Particular specifications of the product are as follows:

A representative of the product is a truck - model flat truck, designed for the transportation of loads to short and medium distances, with a possible use of trailers. The modular design of the vehicle makes it possible to assemble groups both from different producers and from own production. Four-wheel design with driven rear axle, two propellers with Cardan joints.

Weights	
Kerb weight	7,500 kg
Effective weight	10,000 kg
Total weight	17,500 kg
Total weight of the trailer	23,800 kg
Total weight of the set	41,300 kg

Engine	
Diesel, four-stroke, in-line cooled with water, with direct injection, supercharged with turbo-blower	
Number of cylinders	6
Net power output (ISO)	212 kW at 2000 RPM
Net torque (ISO)	1,170 Nm at 1300 RPM

Clutch	
Single, spring, friction with hydropneumatic booster	
Dimension of lining	ø 420

Gearbox
Mechanical with preselected halving overdrive gear
Number of speeds 10/2

Frame
Rectangular, riveted from pressed longitudinal beams and braces made of steel plate

Front Axle
Rigid, forged, I-profile

Rear Axle
Rigid with differential lock and reductions in wheels
Total gear ratio 5.08

Suspension
Front design - longitudinal leaf half-elliptic springs, stabilizers and telescopic absorbers

Rear design - longitudinal, half-elliptic springs with progressive effect and stabilizers

Steering Gear
Hydraulic power assisted steering
Max. torque 3,500 Nm
Max. force at steering wheel 130 N

Brakes	
Service pressure	800 kPa
1. Service - foot-operated, air, two-circle	
2. Emergency - foot-operated, air	
3. Parking - shoe, spring	
4. Relieving - exhaust, flap	
Fitted with ABS system	
Electric Installation	
Voltage	24 V
Batteries	2 x 12 V/180 Ah
Alternator	28 V/45 A
Starter	8 kW/24 V
Wheels and Tyres	
Tyres	295/80R 22.5
Rim	8.25 x 22.5
Pressure in front/rear tyres	875/725 kPa
Driver's Cabin	
Design - complete, tilting, short, two-door, welded, in trambus form, flexibly suspended	
Number of seats	2
Platform	
Design - complete made of steel pressed beams and profiles, in TIR design	
Platform area	6,645 x 2,420 mm
Side height	800 mm
Central arcs and covering sheets can be supplied on customers' request	

General Data

Specific output of the set	5.19 kW/t
Maximal speed	95 km/h

Contents of Service Media

Volume of fuel tank	2 x 180 l
Contents of oil in engine	24 l
Contents of water	59 l
Contents of oil in gearbox	23 l

In case production of modifications (towing vehicle, dump truck, tractor, etc.) is required, the modifications can be produced in the halls designed for production of the basic model - flat truck, and the number of produced pieces will be reduced according to complexity of individual modifications.

LIST OF GROUPS AND SUB-GROUPS OF OVN PRODUCTION AND SUB-SUPPLIES

	OVN PRODUCTION	SUB-SUPPLIES
1.		Complete engine with clutch
2.	Complete gearbox	
2.1.		Complete front propeller shaft
2.2.		Complete rear propeller shaft
3.	Axles	
3.1.	Complete front axle	
3.1.1		Machined forging of the front axle
3.1.2		Front springing
3.1.3		Rimming
3.1.4		Braking cylinders

3.1.5		Complete brake shoes
3.1.6		Telescopic absorbers
3.1.7	Complete head and connecting steering rod	
3.2.		Complete rear axle
3.2.1		Rear springing
3.2.2		Riming
3.2.3		Spring braking cylinders
4.		Complete power assisted steering
4.1	Complete steering rod	
5.	Complete frame	
5.1	Air cleaner	
5.3		Hydraulics, cabin tilting
5.4.	Battery box	
5.5.	Exhaust silencer and tubes	
5.6.		Water cooling
5.7.		Fuel tanks
5.8.	Spare wheel holder	
5.9.	Silencing covers	
5.10.	Minor chassis parts, pedals, levers, pull rods, holders, clips, brackets, fixing elements, etc.	
5.11.		Minor chassis parts (air and hydraulic distributors, valves, armatures, etc.)

6.	Complete equipped cabin	
6.1.		Set of pressings for cabin
6.2.		Instrument board
6.3.		Ventilation
6.4.		Fittings, locks, window droppers
6.5.		Glasses
6.6.		Electric accessories
6.7.	Ignition harness	
6.8.	Driver's and passenger's seats	
6.9.	Running boards	
6.10.		Front fenders
6.11.	Upholstery	
6.12.		Complete engine cover
6.13.		Front cover
6.14.		Wheel archs
6.15.		Front bumper
6.16.		Gaskets
7.	Complete platform	
7.1.	Grate	
7.2.	Side	
7.3.	Rear Face	
7.4.		Rear fenders
7.5.		Fittings
7.6.	Archs	
7.7.	Sheets	
7.8.		Attachment for trailer
8.	Accessories	
8.1.		Batteries
8.2.		Sets of tools
8.3.		Tyres and inner tubes

7.2. INITIAL PREREQUISITES

7.2.1 Existing utilizable technology

The selection of own production of truck assemblies and sub-assemblies and their technology are aimed at maximum utilization of existing machinery and equipment in the various workshops.

Especially in the production of transmission parts of vehicles and front axles, a balanced use of existing technology is possible.

Metallurgical operations

Foundry - the existing capacity of the foundry will be used in particular for the casting of gearbox casings and for making grey cast-iron castings for front axles, in quantities according to the output of vehicle units in several variants.

For the use of other tehnologies of the existing foundry, alternative possibilities will depend on the construction of the transmission.

Precise steel castings	60 - 110 tons p.a.
Aluminium castings of transmission covers	42 - 77 tons p.a.
Bronze castings	1.2 - 2.2 tons p.a.

Forge - the existing capacity will be used primarily for the making of forgings of transmission gears and shafts, and forgings for the front axle (pins and levers).

The assumed output of forgings according to the variants.

Normalizing annealing of forgings will be done in the remaining heat treatment capacities, cleaning with the use of existing equipment.

Mechanical production (machining shop)

Of the 186 conventional machines, altogether 164 will be use for machining transmission parts, especially components of the operating mechanism and front axle parts; they will be equipped with jigs and fixtures according to the character of operations.

Heat treatment

The existing hardening shop equipment will be used mainly for hardening transmission gears and shaft parts, and heat treatment of front axle parts.

The envisaged volume of thermally treated parts according to the variants:

Var. 1	- ca.	875 tons p.a.
Var. 1A	- ca.	1,515 tons p.a.
Var. 2	- ca.	410 tons p.a.
Var. 2A	-	875 tons p.a.

The capacity of the hardening shop for variants 1, 1A, 2A is supplemented by one multi-purpose furnace for general use.

Body and assembly shop

Twenty-two of the existing 26 machines are to be used for the production of chassis parts, platforms and cabs. This will be mainly the existing welding and forming equipment.

General workshops

Use is also envisaged of 20 universal machine tools in the tool-making workshop and 17 machines in the maintenance shop.

The remaining machines for machining large-size parts can be alternatively ionstalled in connection with the extension of maintenance shops, and used primarily for cooperation production of large parts.

7.2.2. Time funds

For one-shift work

Number of work davs per year	250
Number of man hours per day	7
Vorkers fund/year	1,750
Technological work places/year	1,800

Two-shift work

Vork in two shifts is understood to be full two-shift operation with fully manned production work places. Lower shift factor just as unevenly manned individual production centres would affect both the capacity of decisive machines and, especially in the case of large-size products, workshop space.

Number of work days per year	250
Number of man hours per day	7
Vorkers fund/year	1,750
Technological work places/year	3,600

7.2.3 Energy and attendant systems

The proposed solution is based on the following assumptions:

- Electric energy and water supply for the plants is sufficient
- Sewage waste waters will be treated in the existing treatment plant outside the factory
- The compressor station capacity is below the level of the required quantity of air
- The existing light-current exchanges will be used after the proposed extension of the plant
- Fire prevention will be devised in the extent corresponding to the existing system

7.3. PRODUCTION SYSTEM

7.3.1. Technological production process

Type and organization of production

A series type of production has been projected. It is assumed that also in the future, work will be for the most part of body and assembly character. Organization-wise, the plant is divided into:

- forge
- foundry
- mechanical production
- body and assembly work

Mechanical production consists of:

- production of toothed parts
- production of shafts
- production of other parts of transmissions and front axles
- heat treatment (existing facility)
- production of transmission and front axle housings
- assembly of transmissions
- running-in of transmissions
- front axle assembly
- plating shop

Body production and assembly work is divided according to the production process into:

- production of body amd chassis parts and sub-assemblies
- cab welding
- production of frames
- production of platforms
- assembly of engines and transmissions
- paint shop
- assembly of chassis
- finishing of cabs
- tests and running in
- "repase" - located in a separate facility

- finishing of vehicle outfitting
- assembly of platforms
- delivery

Separately located workshops:
- upholstery, electrical installations
- preparation of tyres and batteries

Production technology

Mechanical workshops

New semi-automatic lathes are proposed for the production of toothed parts, existing machines for the production of gearing. To be added are machines for hole and face grinding, and special machines for finishing gearing. Surface finishing will be by shaving.

For the production of shafts, the existing copying lathes will be used, possibly supplemented for higher capacities with NC lathes. Grinding of surfaces and grooves is envisaged. New hobbing cutters will be needed for shaft gearing. The existing broaching machines will be used. Individual bearings are envisaged; when sliding bearings are used, the volume of grinding operations will be reduced.

The production of gearwheel parts and shafts will be arranged in accordance with production operations. Conventional machines, predominantly the existing ones, will be used for general mechanical production. For higher capacities, more lathes will have to be acquired.

For the production of centric parts, machining centres have been proposed - three for transmissions, two for front axles. This workshop will receive, for the production of brake drums and/or other larger parts, some of the existing machines, i.e. a vertical turret lathe, a facing lathe, a vertical grinding

machine, a horizontal drilling machine and a milling cutter for machining base surfaces.

Transmissions and front axles will be assembled on short assembly lines. A special work station will be set up for running-in of transmissions.

Zinc coating will be added to the plating operations. For intermediate degreasing operations, a washing machine using alkalic solvents will be added.

The existing foundry equipment is sufficient.

The existing hardening shop will be used, with a multi-purpose furnace added in the event of production capacity in excess of 1,500 vehicles a year.

According to available data, the capacity of the forge appears to be sufficient, with the exception of induction heating where one medium-preventer induction heating unit is proposed. The projected production will require a complete change of the disposition arrangement of production, with the exception of the plating shop. Material preparation will be moved to a new body and assembly facility near the store room of drum material.

In the event of higher output than 1,500 vehicles a year, production of tools and cutlery will have to be discontinued, or moved into a separate facility.

Intermediate handling will be by high-lift trucks and pallets 800x600x600 mm. Chips will be collected in special carts and transported to the scrap dump by high-lift trucks.

For mechanical production, tool-making shop, maintenance and material preparation, including production of chassis parts in

the body and assembly shop, the following machines and equipment will be needed:

	Variants	
	1, 1A	2, 2A
Total	306	240
of which: existing	186	160
new	120	64

Body production and assembly

Welding

Vehicle cabs will be made of supplied stampings. and shaped by manual resistance technology. Also fusion welding in protective CO_2 atmosphere will be used in the production of chassis parts and platforms.

Vork stations will be equipped with assembly jigs, with possible back-up jigs.

Chassis frames will be assembled of longitudinal and diagonal beams, holes drilled with the use of templates. Cold riveting will be used for connections. Products of large size will be brought into the paint shop by an overhead conveyer.

Finishing operations

For a large number of components, including cabs, three-layer technology comprising the following main operations is recommended:

- chemical pre-preparation by zinc-phosphate coating
- priming by electrophoresis dipping technology - cementing of uneven surfaces (of some parts)
- spraying of undercoating in electromagnetic field
- spraying of surface enamel coat in electrostatic field

Application will be done on a line which will be equipped with the necessary devices connected partly to an overhead conveyer and partly to a floor conveyer.

A simpler technology is to be used for surface finishing of grating and attached parts on a special line for manual cleaning and spraying of two coats of paint, with sections for thinner evaporation and drying.

Besides the two lines, there will be also an operation for surface finishing of chassis on the assembly line, in a spraying and drying tunnel booth.

In the event of lower capacities, chassis will be returned onto the main line.

For other surface finishing of small parts, and/or pipes, equipment will be used for degreasing and spraying in a booth, dipping in a tank and drying in a chamber.

There will be separate equipment for spraying and drying assembled engines and transmissions.

Assembly

Cabs will be equipped on a cart line, with supply for final assembly. Platform woodwork will be in direct follow-up to the paint shop.

Chassis assembly will be on an intermittent-tact assembly line. It will contain booths for degreasing and spraying.

Pre-assembly will be devised in direct connection with the final assembly line. On this area, storing and readying material for assembly work stations, supplied by high-lift trucks, is projected.

Vehicles will be road-tested.

The work station of minor adjustment repairs is projected in a separate building with an open front wall, in order to eliminate exhaust gas problems in the hall.

All "reepase" work will be done in the hall.

Platform assembly is projected in direct connection with vehicle delivery to customers.

Final adjustments will be made within delivery operations in a system of parallel boxes. Material handling will be by cranes, overhead holders and high-lift trucks, possibly by handling devices.

Upholstery will be done on manual work stations equipped with
- sewing machines
- dielectric welding units
- special assembly equipment

Cutting will be done on desks equipped with shears, cutting machines and band saws.

Bunched cables will be made manually on work stations equipped with cable cutting, insulation removing and cable-end connector pressing devices.

7.3.2. Auxiliary and attendant operations

Tool shop
Maintenance shop
Technical inspection laboratory
Oil service
Scrap disposal

Tool shop

provides special production tools and measuring devices for the basic production process. Hand tools include tools for adjustments, clamping tools include forming jigs and clamping and machining jigs. Part of the capacity is used for renovation of tools and jigs. Special measuring instruments include bore and other gauges, larger gauges up to 700mm, for measuring diagonals, axes etc.

Also envisaged is production of some tools for stamping presses and punching machines.

Heat treatment of steel tools will be also done in the tool shop: cementing, hardening and heat treatment operations will be performed in the existing booth.

Tools will also be sharpened in the tool shop whose capacity is designed for 10-12% of the capacity of the production machinery.

For the automated machines centre, there will be a work shop for pre-adjustment of tools.

The tool shop will be equipped with existing machines, installation of new coordination drilling machines is envisaged. New tool sharpening machines will be added to the existing ones.

Maintenance

The main maintenance task is care for principal equipment. It is envisaged in the buildings of mechanical production, body and assembly work, and in a separate facility for central large-scale maintenance. Maintenance of buildings will be also based here. Maintenance will handle medium repairs of only simple conventional machines.

The extent of repair work is determined by a method of differentiated care based on

- differentiation of machines and equipment according to their importance (short-supply, conventional)
- construction and operational characteristics
- repair characteristics
- actual utilization of machines

Maintenance is divided into

- diagnostic and inspection work
- maintenance of electronic equipment
- maintenance of electrical engineering equipment
- maintenance of mechanical equipment

The mechanical part of the maintenance shop will be equipped with existing machines.

Technical inspection laboratory

makes checks of gauges and measuring instruments,and inspections of toothed parts, especially outside ones made in the factory. The laboratory should be located in the main mechanical production facility. Its equipment will be supplemented with new machines.

Oil service and oil storage

will mainly prepare cooling emulsions for machine tools.

7.3.3. Transport, material handling and storage

Transport outside the plant

The plant does not have a railway siding. Materials to and from the plant will be transported by trucks. A part of the transport system is the existing weight bridge. Cost of materials transport is not included in investment costs; contract carriers are envisaged. For transloading of containers in the plant area, the use of a special vehicle or a 20-ton crane is projected.

Transport within the plant

Transport between plant facilities will be handled by light trucks, high-lift trucks and transport vehicles equipped with catalytic converters so that they will be able to enter buildings. In view of the character and location of production operations within the plant, and the quantity and kinds of materials, transport is projected as irregular.

Transport centre

The project envisages extension of the existing garages and vehicle maintenance workshop.

Storage system

has been designed for the kinds and quantities of materials necessary for the manufacture of finished products, and for auxiliary and attendant operations.

It is desirable to keep only the minimum stock necessary for maximum operating certainty.

Projected structure of the storage system

Supply stores

6 - Supplies from subcontractors
101 - Bulky supplies from subcontractors
101 - Cab stampings
101 - Metallurgical material

103 - Upholstery material
103 - Electrical installation material
11 - Flammables, chemicals, paints
110 - Gases
107 - Tyres
107 - Accumulators - storage and charging
111 - Outdoor storage of metallurgical material
111 - Outdoor storage of supplies from subcontractors
108 - Oils and motor fuels
112 - Scrap dump
- Forgings and castings
- Sales storage
101 - Vehicles delivery
105 - Lay-by area for finished vehicles
106 - Sales of vehicles

Storehouse for supplies from subcontractors - facility 6

Supplies from subcontractors are to be stored in what is now the storehouse for finished products. It is intended to store most of the purchased parts here, on pallets 800 x 600 and 1200 x 800mm. In a part of the storehouse, racks with an automatic stowing device will be installed; there will be four lanes with racks, 7 m long. The capacity will be ca. 5,000 pallets. In the part of the storeroom for large pieces, supplies from subcontractors will be stowed on pallets designed for block storing in four tiers. It is assumed that whole pallets will be taken to the appropriate places. For handling, a 3.2-ton crane is projected, high-lift trucks and manually handled carts.Also indirect material supplies will be stored on pallets here, for high-lift truck handling, issue by pieces. A part of the material will be stored freely. The assumed storage time is 1-2 months, according to the production variants.

Bulky supplies from subcontractors - facility 101
Large parts (engines, rear axles, front axles) will be stored in the body and assembly workshop, near the chassis assembly station; handling by a 5-ton crane and high-lift trucks

Cab stampings and cold-rolled material - facility 101
This storeroom is situated in a separate nave of the body and assembly shop, near the welding shop. Storing in blocks of pallets and special racks. Handling by 12.5- and 5-ton cranes and high-lift trucks.

Storeroom for upholstery material and electrical material
will be in the workshop where this material will be used.

Flammables
chemicals and paints will be stored in the existing building

Gases
Oxygen, acetylene and carbon dioxide will be stored in cylinders in a separate building. The cylinders will be in stalls from which the gases will be conveyed by pipes where needed. Handling manual, with a cart.

Tyres
including wheels and inner tubes, valve cores etc. will be stored in a separate building near the wheel assembly workshop. Tyres will be stowed in four tiers of pallets, the other parts in racks. It is assumed that disks will be delivered to the plant already with surface finish. Handling will be by a crane and high-lift trucks, wheels will be assembled manually, by means of mechanical devices. Wheels will be balanced.

Accumulators
will be transported on special-purpose pallets and stored in racks in the wheel assembly shop. It is assumed that dry

batteries, charged, will be delivered. There is to be a storeroom for electrolyte, distilled water production, minor repairs, charging and gauging. Handling by battery-powered truck.

Bulky metallurgical material
will be stored outdoors, under the crane track, near the storehouse of metallurgical material in facility 101. Materials requiring special handling will be stowed in tree-shaped racks. Bars will be transported by a specially designed cart. A part of the area will be used for supplies from subcontractors. A 20-ton crane will be installed.

Oils and motor fuels
are to be stored in a new building, with a new fuel pump. Petrol and Diesel fuel will be stored in underground tanks, 10 - 25 cubic metres. Pipes to the final assembly work station.

Scrap dump
A new roofed area is projected for containers for scrap graded by kind and quality. Transport by high-lift truck. In a facility at the dump, graded scrap metal will be processed for use in the foundry. Chips will be extracted, crushed and palletized.

Forgings and castings
made in the plant will be stored outdoors, on box pallets 1200 x 800 x 600mm. Handling by high-lift truck.

Delivery storage facility
is in the body and assembly workshop. For sales purposes, an area for finished vehicles has been projected, and a new salesroom in which customers will take delivery of vehicles.

7.3.4. Consumption of main materials and raw materials (in tons)

	Variant			
	1	1A	2	2A
Supplies from subcontractors	13,790	25,281	6,895	13,700
of which: wheel disks	1,050	1,925	525	1,050
pcs.	21,000	38,500		21,000
tyres	2,500	4,583	1,250	2,500
pcs.	21,000	38,500		21,000
accumulators	240	440	120	240
pcs.	6,000	11,000	3,000	6,000
electrical instal.material	105	192.5	52.5	105
Metallurgical material	8,900	16,317	4,450	8,900
of which: sheet metal	5,500	10,083	2,750	5,500
profiles,tubes,bars	3,400	6,233	1,700	3,400
cab stampings	1,050	1,925	525	1,050
forgings	1,100	2,016	550	1,100
castings	1,300	2,383	650	1,300
upholstery	108	198	54	108
paints	390	715	195	390
oils, lubricants etc.	300	550	150	300
flammables	620	1,136	310	620
chemicals	200	366	100	200
indirect material	220	400	110	220
metal scrap	1,692	3,102	864	1,692
other scrap	320	584	160	320

7.3.5. Areas recapitulation

Building	Variant (in sq.m)			
	1	1A	2	2A
New areas				
body and assembly workshop	26,730	27,870	19,000	19,680
upholstery, elect. instal.	1,430	1,630	852	852
central maintenance	1,080	1,080	790	790
tyres, battery charging	2,130	2,130	1,700	1,700
scrap dump	470	470	470	470
oils and motor fuels	450	450	330	330
gases	290	290	290	290
"repase", running-in	1,500	1,500	1,140	1,140
vehicles delivery	600	600	600	600
compressor station	234	234	234	234
garages	290	290	290	290
social facility	-	290	-	-
outdoor storage w. crane	1,730	1,730	1,296	1,730
track				
Total area increase	36,934	38,564	26,992	27,672

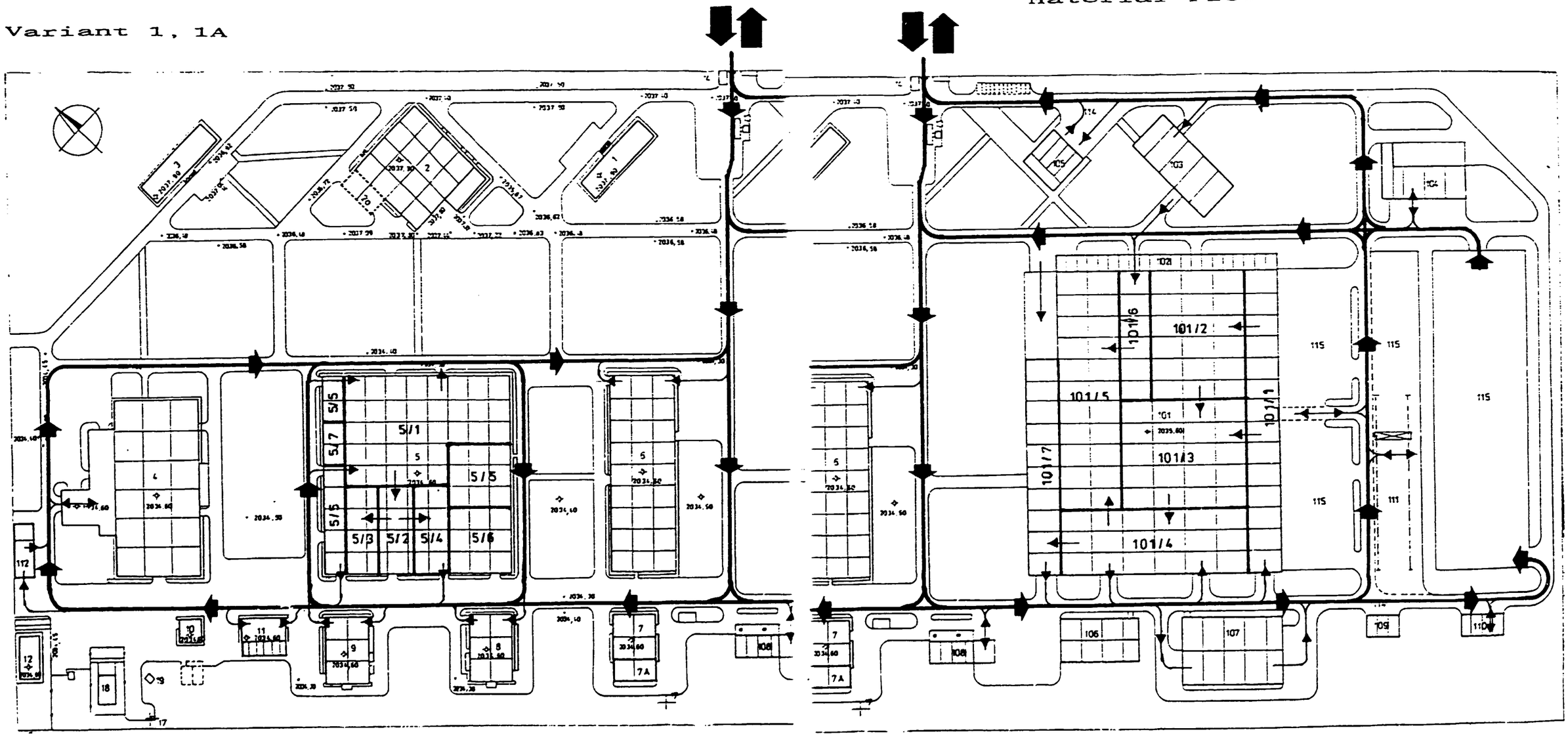
LEGEND - VARIANTS 1, 1A

1	Administration BLG
2	Social Services
3	Technical Office
4	Foundry
5	Mechanical Workshop
5/1	Mechanical Production
5/2	Store-House
5/3	Assembly of Front Axle
5/4	Assembly of Gear Box
5/5	Auxiliary Operations
5/6	Plating Shop
5/7	Energetics
6	Finished Parts Store-House
7	Vehicle Maintenance Garage
8	Heat Treatment
9	Forge
10	Water treatment
11	Store-House for Combustible Materials
12	Electric Sub-Station
13	Weight Bridge
14	Gate Reception
17	Water Well
18	LPG Storage
19	Piezometric Tower
20	Fuel Storage
101	Body & Assembly Building
101/1	Store-House for Finished Materials and Products
101/2	Production of Chassis Parts
101/3	Cabin Welding Shop & Production of Frames and Platforms
101/4	Varnishing Shop
101/5	Assembly of Chassis, Cabins and Vehicles
101/6	Store-House for Usual Sub-Supplies
101/7	Dispatching of Vehicles
102	Hygienical & Service Addition
103	Production of El. Installation & Upholstery Shop
104	Repairs
105	Transfer Hall
106	Central Maintenance
107	Store-House for Tyres and Wheels
108	Store-House for Fuels
109	Compressor Station
110	Store-House for Gasses
111	Open Stock
112	Store-House for Waste

ROAD VEHICLE PRODUCTION AKAKI

Material Flow

Variant 1, 1A



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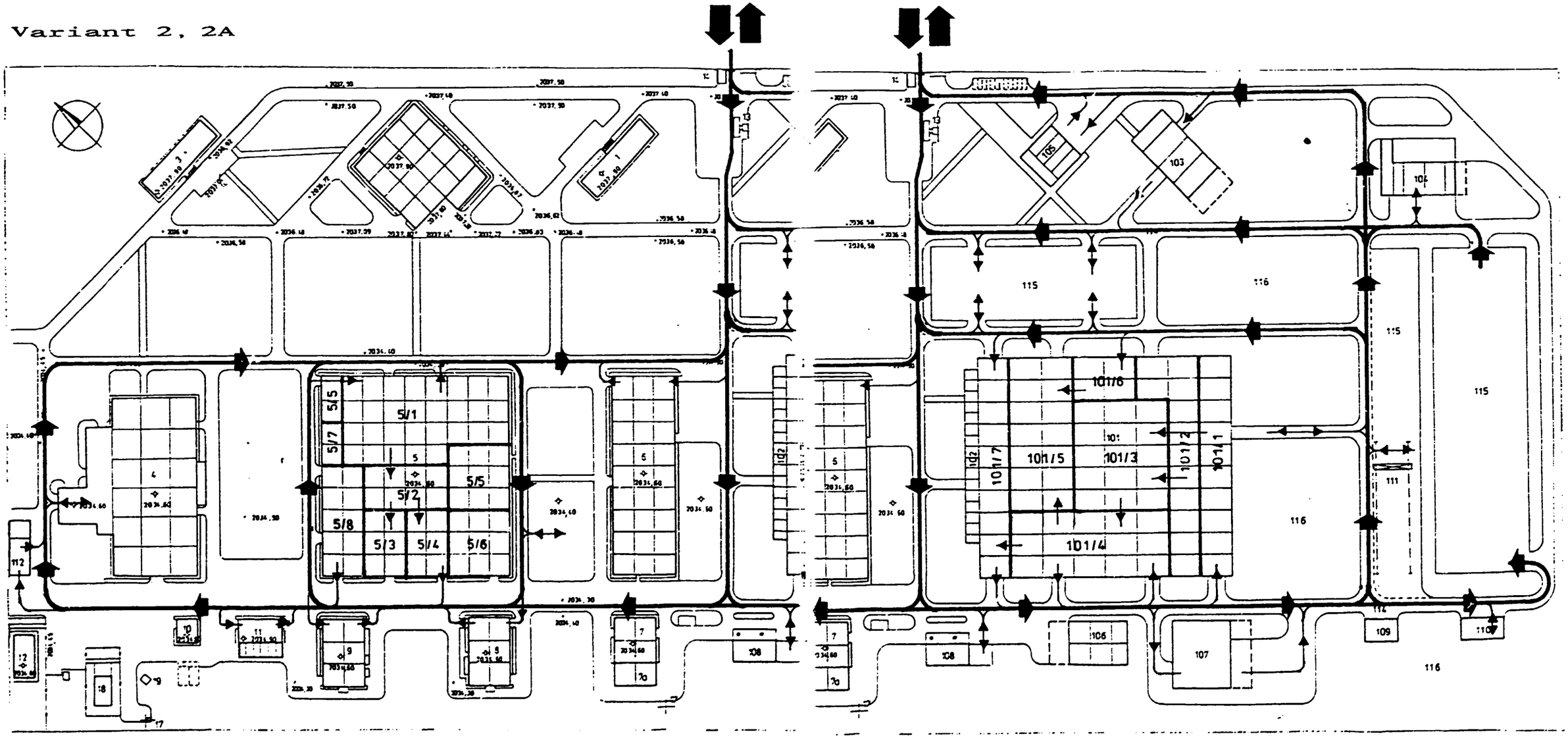
LEGEND - VARIANTS 2, 2A

1	Administration BLG
2	Social Services
3	Technical Office
4	Foundry
5	Mechanical Vorkshop
5/1	Mechanical Production
5/2	Store-House
5/3	Assembly of Front Axle
5/4	Assembly of Gear Box
5/5	Auxiliary Operations
5/6	Plating Shop
5/7	Energetics
5/8	Existing Production
6	Finished Parts Store-House
7	Vehicle Maintenance Garage
8	Heat Treatment
9	Forge
10	Vater treatment
11	Store-House for Combustible Materials
12	Electric Sub-Station
13	Veight Bridge
14	Gate Reception
17	Vater Vell
18	LPG Storage
19	Piezometric Tower
20	Fuel Storage
101	Body & Assembly Building
101/1	Store-House for Finished Materials and Products
101/2	Production of Chassis Parts
101/3	Cabin Velding Shop & Production of Frames and Platforms
101/4	Varnishing Shop
101/5	Assembly of Chassis, Cabins and Vehicles
101/6	Store-House for Usual Sub-Supplies
101/7	Dispatching of Vehicles
102	Hygienical & Service Addition
103	Production of El. Installation & Upholstery Shop
104	Repairs
105	Transfer Hall
106	Central Maintenance
107	Store-House for Tyres and Vheels
108	Store-House for Fuels
109	Compressor Station
110	Store-House for Gasses
111	Open Stock
112	Store-House for Vaste

ROAD VEHICLE PRODUCTION AKAKI

Material Flow

Variant 2, 2A



7.4. Energy systems and water economy

7.4.1. Electrical energy

Energy intensiveness of projected production

Energy balance sheet for newly projected mechanical production and assembly operations:

Installed capacity	
variants 1, 1A	12,500 kV
variants 2, 2A	10,850 kV
Computed load	
variant 1, 1A	3,750 kV
variant 2, 2A	3,250 kV
Annual consumption	
variant 1	3,940 MVh
variant 1A	7,880 MVh
variant 2	2,850 MVh
variant 2A	5,690 MVh

Electricity consumption in the existing foundry, forge and hardening shop, necessary for production of vehicles

variant 1	3,620 MVh p.a.
variant 1A	7,020 MVh p.a.
variant 2	1,810 MVh p.a.
variant 2A	3,620 MVh p.a.

Other consumption in existing facilities (lighting, heating of industrial water etc.)

variant 1	580 MVh p.a.
variant 1A	1,240 MVh p.a.
variant 2	580 MVh p.a.
variant 2A	1,200 MVh p.a.

Total consumption of electrical energy	
variant 1	8,140 MVh p.a.
variant 1A	16,140 MVh p.a.
variant 2	5,240 MVh p.a.
variant 2A	10,510 MVh p.a.

Proposed solution

The input transformer station 45/15 kV will be converted to 3 x 6 MVA. Transformer substations in the new part of the plant will be connected to a new 15 kV loop. In facility 101, three transformer substations are considered for variants 1 and 1A, each with two 15/0.4 KV - 1000 kVA transformers - total installed capacity 6,000 kVA.

Variants 2 and 2A differ only in the number of transformers - the total installed capacity of the transformer stations will be 5,000 kVA. The other facilities will be connected by narrow voltage to the transformer stations in facility 101. Emergency lighting will be connected to two emergency diesel units in the social annex at facility 102. The output of the emergency sources will be 2 x 100 kVA.

7.4.2. Air-conditioning

The projected air-conditioning installation is to ensure healthy conditions at work stations in all parts of the plant.

Primarily, it will exhaust harmful substances directly at the place of origin, and prevent their dispersion over a wider area of the building.

Generally, buildings are ventilated by windows, skylights etc., with the exception of the paint shop where, for technological reasons, ventilation is forced, by conditioned air. Together with

new technological equipment, new air-conditioning equipment is being installed in the building: intermediate washers of parts, unit exhausts at grinding machines in the workshop, etc. In the plating shop, new vats are being installed, with exhausters. In the new body and assembly shop and in the paint shop, ventilation equipment is being installed, for technological reasons. Central air intake units, with automatic regulation, are mounted on the roof of the building. Air is filtered in them, and forced into the paint shop. Its technological equipment, i.e. boxes etc., has its own air-conditioning, supplied directly by the manufacturers of the painting and drying boxes. At individual work stations, air-conditioning equipment has been installed according to the requirements of the technological process; for the most part,it will exhaust emissions during engine tests, etc.

In other buildings, air conditioning equipment has been projected as required by technology, to exhaust dust, vapours and other harmful emissions originating during production operations in the joinery shop, neutralization work station, battery charging station, manufacture of seats and tyre storeroom.
These air-conditioning units differ mainly in their number, according to the variant solutions. For all variants, air conditioning equipment is analogical.

Electric power consumption of air-conditioning equipment:

variant 1, 1A	260 kW
variant 2, 2A	170 kW

7.4.3. Compressed air

Body and assembly workshops

Installed capacity	13,300 cubic m per hour
Computed load	4,000 cubic m per hour

Proposed solution

Variants 1 1A

A new compressor station is projected, with three screw compressors with an output of 2,000 cu.m. per hour each, 3 x 200 kV. Two would be in operation at all times, one in reserve.
Air cooling and drying will be a part of the compressor station.

Variant 2, 2A

Installed capacity will be reduced to 10,600 cu.m. per hour. The equipment of the compressor station will be identical with variant 1.

Compressed air for the foundry, forge, hardening shop and mechanical workshops will be supplied from the existing compressor station. Consumption is 1,200 cu.m./h.

7.4.4. Technical gases

For production purposes, CO_2, O_2 and C_2H_2 must be available in the following quantities:

Variant 1		
O_2	1 cu.m./h.	300 cylinders p.a.
CO_2	6 cu.m./h.	550 cylinders p.a.
C_2H_2	0.6 cu.m./h.	180 cylinders p.a.
Variant 1A		
O_2	1 cu.m./h.	600 cylinders p.a.
CO_2	6 cu.m./h.	1,100 cylinders p.a.
C_2H_2	0.6 cu.m./h.	360 cylinders p.a.

Variant 2

O_2	1 cu.m./h.	150 cylinders p.a.
CO_2	6 cu.m./h.	275 cylinders p.a.
C_2H_2	0.6 cu.m./h.	90 cylinders p.a.

Variant 2A is identical with variant 1

7.4.5. Water economy

In view of the fact that water consumption will not be substantially higher, the projected solution rests in completion of the water-supply network in the new buildings, and in construction of circulation circuits for new consumption places, i.e. the welding and compressor shops, with capacity 2 x 25 cu.m. Water consumption for the work force will be increased by about 19%, in consequence of the increase in the number of employees by 170 persons. Industrial water consumption, i.e. refilling of water in circulation circuits amounting to 5% of circulated water will be 20 cubic metres daily in one-shift operation, about double the quantity in two-shift operation. Since the plant has at its disposal another well yielding 23.4 cu.m./h., it can be assumed that it will be fully supplied from existing sources.

7.4.6. Sewerage

It is not necessary to consider the sewerage system in connection with extension of the plant. There will be only partial enlargement in the area of plant extension. As regards sewage treatment, intermediate treatment plants are considered at places of origin of sewage, and release of treated water into sewage drains. Two intermediate treatment plants are projected for disposal of sewage from the paint shop and of cutting emulsions. Sewage from the paint shop will be by chemical coagulation and separations of undissolved substances. Used cutting emulsions

will be liquidated by breaking down and separation of oils and undissolved substances.

7.4.7. Communications equipment

Installation of telephones, P.A. system, clocks and an electrical fire alarm system is considered. Installation will be devised as universal, with possibility of variants according to production needs.
Installation of manual and automatic fire alarms in buildings will be designed in accordance with fire prevention requirements.

7.5. CONSTRUCTION DESIGN

7.5.1. Architectonical solution

In accordance with the general layout of the existing part of the plant, the three main zones are to be extended in the south-eastern direction, which is also required by the production flow which begins with the foundry in the northwest. In the zone of social and administration buildings, beyond the transverse axis of the plant running from the gates to the garages, the delivery hall will stand. Also located here will be the building for manufacture of electrical installations and upholstery, with a relatively high number of workers (including women), for which there is a reason in this area because of the character of the workshop with a large part of manual work. Also the building for final inspection and adjustment of vehicles will be here, adjacent to the assembly hall and the parking area.

The main production building in the production zone is designed as a single block comprising the paint and welding shops, and the assembly hall with adjacent social and administration annex.

Also an area for outdoor storing and for finished products will be here.

In the zone of energy and storage facilities, there will be the central maintenance shop, compressor shop, storehouse for motor fuels and oils, storehouse for gases, storehouse for tyres and disks, facility for batteries, charging and renovation, and a garage annex. A new 1,200-metre fence will be added.

As regards appearance, the buildings will be designed so that the new part of the plant southeast of the main axis will not be too different. The main production hall and smaller halls will have light metal outer shells, with bands of windows; their shapes will be simple. Small storehouses will be designed analogically,

in combination with masonry. In view of its commercial and publicity importance, the vehicles delivery hall will be conceived attractively, especially as regards the materials used; this applies also to the interior (lining and facing, soffits, advertising features.) Outside the building will be a designed area with a flagpole on a base (company logo etc.)

Locations of the buildings have been chosen with regard to possible expansion of production, from the smallest variants 2A and 1 to the so far largest variant 1A. Should production increase in this way in the years to come, the resulting shape of the main supply block (facilities 101 and 102) will not be identical in variant 1A with the shape of this block resulting directly from variant 1.

They would differ in the location of annex 102 along the main transverse axis, and future enlargement of the block will be possible only in the south-eastern direction. However, this does not matter because the transverse axis from the gates to the garages would be preserved. There will be no connection of facilities 101 and 6, in order to keep the transport system clearly arranged and the layout simple.

7.5.2. Production spaces

Production facilities are Nos. 101 - body and assembly hall, 103 - electrical installations and upholstery, and 104 - final inspection and adjustments. They are the largest new buildings, and will be identically designed.

No. 101 - Body and assembly shop

Variant 1 - Single-storied steel-girder hall, modular network 18 x 12m, height 8.4m under girder; on supporting shoes, with a lightweight metal sandwich shell with a brick parapet and a metal

roof shell. Roof skylights will be designed in shed-style, the band of single-pane steel windows will have wings opening from the ground. There will be cranes in some naves, for loads up to 3..2, 5 and 12.5 metric tons. The overall size of the hall will be 144 x 168m, an area of 48 x 18m for finishing operations will be designed as shed above the lay-by area. There will be two built-in sanitary facilities in the hall, lath-roofed at 3 metres.

Variant 1A - the hall would have the same parameters and construction design as in variant 1.

Variant 2 - single-storied steel-girder hall, modular network 18 x 12m, height under girder 8.4m, overall dimensions will be smaller - 120 x 144m.

Variant 2A - identical as regards construction with the hall in variant 2.

No. 103 - Electrical installations and upholstery workshop

Variant 1 - Double-nave ground-level steel hall, parameters (12 + 12) x 12m, height 4m under girder, annex 9 x 24m with offices, toilets and locker rooms with wash rooms for about 40 men and 20 women, two offices for six technical employees. Light metal shell of sandwich type, brick or block parapet, single-pane steel windows, openable,shed-type skylights along the inner row of pillars, central shell light, sandwich-type, on steel sheet.

Variant 1A - hall identical with variant 1, two-level 9 x 24m annex, because locker rooms must be for 120 workers and offices for about ten persons.

Variant 2 - Building of the same construction type but shorter: 36 x 24m.
Variant 2A - identical with variant 1

No. 104 -"repase"

Variant 1 - ground-level steel building of hall character, without the front peripheral wall, parameters 188 x 12m, with a simple roof of steel sheet with a shed-type unglazed skylight, inner walls from concrete or brick blocks. A steel lean-to on the northeastern side above a concrete plateau on which cars may be parked. Built-in sanitary facility for eight under the lean-to, size 6 x 12m. Overall dimensions 30 x 48m.

Variant 1A - Same dimensions, sanitary annex larger (8 x 12m) because the locker room will be for 16 workers.

Variant 2 - Same construction nad parameters but smaller (36 x 30m).

Variant 2A - Identical with variant 2.

7.5.3. Attendant systems

In the third zone of the plant, facilities of the attendant system - garages and the central maintenance workshop - will be situated.

The existing 24 x 24m garages will be enlarged by one whole field along the entire width of the building and in the same height; a new hall-type building of the maintenance shop will include also social areas for drivers.

No. 7 A - enlargement of garages and the maintenance workshop

Variant 1 - Annex to the existing facility, axial parameters 12 x 12m, size 24 x 24m, height 4.5m; area 12 x 24m in a steel structure with a light steel shell and a steel roof without skylights, brick parapet and dividing wall, steel windows and gate.

Variants 1A, 2, 2A - identical design with variant 1.

No. 106 - Central maintenance worskhop

Variant 1 - Ground-level steel hall 12 x 12m, overall dimensions 24 x 36m, with a built-in facility 9 x 24m, with an office, locker room for 22 workers, tpilets and a rest room. Shell and the roof shell as in larger halls, including skylights. A 2-ton crane in the first nave.

Variant 1A - Ground plan identical with variant 1, built-in facility with a built-in inner ceiling at 3.3m, first floor to be used for another locker room, wash room and offices, because the number of persons working there will be about 40.

Variant 2 - Building will be shorter - 33 x 24m, parameters and same as variant 1 including the size of built-in facilities.

Variant 2A - Identical with variant 2.

Storage facilities

Storage facilities will be directly in the main production halls No.s 4,5 and 101), as well as in separate budings predominantly situated in the third zone. They are store rooms 107 - tyres, disks, batteries, charging and renovation, 108 - motor fuels and oils, 110 - gases, 111 - outdoor storage area, and 112 - scrap

dump. They are located in logical connection with production operations, in such a way that also in the future, they would not impede further extension of the plant.

No. 107 - tyres, disks, batteries, charging and renovation

Variant 1 - Double-nave ground-level steel hall, parameters 18 x 12m, overall size 36 x 48m, a 2-ton crane in one nave. The 9 x 36m annex will be 4m high, one part will be an office, toilets, locker room and wash room for eight persons, the second part will be used for charging battery trucks. The height of the hall part will be 7.8m under the girder.

Variant 1A - Identical as in variant 1, including social facilities but with a larger locker room for 16 persons.

Variant 2 - Building shortened to 45 x 36m.

Variant 2A - Identical with variant 2

No. 108 - Motor fuels and oils

Variant 1 - Ground-level steel structure, parameters 12 x 6m, height under girder 4m, 450 sq. m. Shell as in hall structures, inside walls of concrete blocks. Outside a concrete area with fuel pumps, roofed and insulated against leakage. Adjacent to the facility will be a concrete insulated plateau for storing fuels and oils in barrels.

Variant 1A - Identical with variant 1, the storing cycle will have to be shortened

Variant 2 - Structure will be reduced in length to 18 x 18m, design identical as in variant 1

Variant 2A - Identical with variant 2

No. 110 - Storehouse for gases

Variant 1 - ground-level steel structure, parameters 12 x 6m, overall dimensions 12 x 24m, height under girder 4m, sandwich-type steel shell, sandwich-type metal roof shell; inner sheet-metal partitions will divide it into four spaces, of which two will be 9m wide, and two 3m wide, with separate entrances. A concrete plateau outside. In the 3m wide par a locker room, wash room and toilets for two workers, accessible from the outside. Partitions in sanitary facilities will be of brick.

Variants 1A, 2, 2A - all identical with variant 1.

No. 111 - Outdoor storage

Variant 1 - Unroofed hard-surface area. Southeast of the main production building will be a 96m long crane track for a 20-ton crane used for stopring and handling operations; height under crane track 9m.

Variant 1A - Identical

Variants 2, 2A - Length 72m

No. 112 - Scrap dump

Variant 1 - Ground-level steel structure, parameters 12 x 12m, dimensions 12 x 36m, open, with a steel roof. A 12 x 12m part for crushing and palletization equipment and a centrifuge will have a sandwich-type steel shell. Vash room and toilet for one person; concrete plateau outside. Under the whole area, insulation against leakage of oil products.

Variants 1A, 2, 2A - identical.

Administration buildings, social facilities

In the first zone of the plant, the existing buildings No. 1 and 2 are being and will be clerical and technical personnel, about 200 employees. These buildings will be neither adapted nor enlarged. Adjacent to the production facility No. 101, an annex will be built as a sanitary facility for this hall (locker rooms, wash rooms, toilets), administration facility (offices, foremen) and attendant facility (about 500 square meters of areas).

Smaller halls will also have their areas for sanitary purposes and offices.

The main social facility - No. 2 between the two administration buildings - used primarily for cooking and as a dining-hall, is to be enlarged in variant 1A. Adjacent to the gate, delivery hall (No. 105) will be built where dealings with customers will take place, and products delivered to them; for these purposes, offices and demonstration areas will be built.

No. 102 - Annex for social and operations purposes

Variant 1 - Two-level steel structure with a shell combining walls of brick blocks or concrete blocks and a light sandwich. The roof shell with insulation on sheet steel and waterprood insulation. Single-pane steel windows, inner partitions of brick, in the office part easily movable; in firt-sloor offices, module soffits. Parameters of the structure are 6 x 6 + 2.4m, constant height of floors 4.5 and 6.6m, total length of structure 126m. two staircases with adjoining social facilities, 72 meters from each other, will be designed as closed as regard fire prevention.

There will be passages from halls on the ground floor, areas for attendant operations, toilets of offices of foremen; on the first floor, besides several offices, will be locker rooms for 430 workers.

Variant 1A - Three-floor annex of the same construction and module parameters. The construction height of the third floor will be 3.6m; only locker rooms will be situated here. Offices will be on the second floor, several foremen's offices also on the ground floor with areas for attendant and serevicing operations, and passages from the hall.

Variant 2 - Two-storied annex of the same parameters and the same construction as in variant 1; the length of the annex will be 96m.

Variant 2A - Annex of identical volume as in variant 1.

No. 105 - Vehicles delivery

Variant 1 - Ground-level hall-type structure, parameters 18 x 6m, overall dimensions 24 x 18m with an annex with sanitary facilities, offices, a tea kitchenette and a conference room. The height of the hall part used for demonstration and delivery of vehicles will be 6m, in the annex 4m, lowered by a suspended decorative soffit; ceramic tiling or wooden panelling in the interior, louvers in windows, three gates with electrically operated roller shutters. Shell in a combination of masonry and a sandwich-type metal shell, sandwich-type roof with a shed skylight on the higher part of the building.

Variants 1A, 2, 2A - all identical with variant 1.

No. 2 - social services, No. 2A - enlargement of the social services facility

Variant 1 - In the existing building, a kitchen has been dimensioned for the original work fore of the plant. about 900 persons; for the envisaged number of 1,000 people taking their meals in the dining hall, only the technological equipment of the kitchen will have to be adapted but enlargement of the area will

not be necessary.

Variant 1A - An area of 24 x 12m will be added to the existing facility No. 2, to enlarge the area of the kitchen, storerooms, and social facilities for kitchen personnel. Partial adaptations will be also made in the existing part of the building. The area of the dining hall will remain the same, lunches for the second shift will be served at another time but on the same area as for the first shift.

Variants 2, 2A - the building will remain unchanged.

7.5.4. Energy systems

The only newly projected part of the energy system is the compressor room (No. 109) in the zone of auxiliary facilities, adjacent to the gas storage.

Variant 1 - Ground-level brick-built structure with a steel roof and a sandwich-type roof shell, size 12 x 18m, height under girder 4.5m. There will be no windows, to reduce noise in the area around the compressor room; only the built-in control room and toilet will have windows; the work station will not be permanently manned.

Variants 1A, 2, 2A - structure identical with variant 1.

7.5.5. Roads

Construction of new facilities is projected south-east of the existing plant. For all of them, a network of roads and lay-by areas is envisaged. The system of new roads will be connected to the existing roads in the plant. They are all to be 7.0m wide. At the facility No. 101, three lay-by areas are projected, with a

crane track on one of them. The surface of the roads and lay-by areas is to be bitumen.

7.5.6. Earth-moving work

For the construction of new buildings, earth-moving work will consist of levelling and finishing work.Levelling is projected on planes according to the height of the various buildings. In the terrain so prepared, all excavation work for individual buildings will be done. Finishing work will be carried out in spaces between buildings and roads, and trees and bushes will be planted in the areas.

TABLE OF AREAS IN SQ.M. AND VOLUME OF BUILDINGS IN CU.M.

		Var. 1			Var. 1A		
No.	Name	Built-up	Floor	Volume	Built-up	Floor	Volume
2A	Social Facility				290	290	1730
7A	Extension of garages	290	290	1800	290	290	1800
101	Bobdy and ass. workshop	24450	24450	273840	24450	24450	273840
102	Annex to social	1140	2280	9800	1140	3420	11140
103	Man. of elektrical install.	1430	1430	7870	1430	1630	7870
104	"Repase"	1500	1500	12010	1500	1500	12010
105	Vehicles delivery hall	600	600	4200	600	600	4200
106	Central maintenance work.	1080	1080	8320	1080	1080	8320
107	Tyre storage	2130	2130	20300	2130	2130	20300
108	Fuels and oil storage	450	450	2560	450	450	2560
109	Compressor station	234	234	1300	234	234	1300
110	Gas storage	290	290	1380	290	290	1380
111	Outdoor storage	1730	1730	17800	1730	1730	17800
112	Scrap dump	470	470	3730	470	470	3730
	Total	35794	36934	364910	36084	38564	368980

		Var. 2			Var. 2A		
No.	Name	Built-up	Floor	Volume	Built-up	Floor	Volume
2A	Social Facility						
7A	Extension of garages	290	290	1800	290	290	1800
101	Bobdy and ass. workshop	17400	17400	194900	17400	17400	194900
102	Annex to social	800	1600	6880	1140	2280	9800
103	Man. of elektrical install.	852	852	6270	852	852	6270
104	"Repase"	1140	1140	9120	1140	1140	9120
105	Vehicles delivery hall	600	600	4200	600	600	4200
106	Central maintenance work.	790	790	6080	790	790	6080
107	Tyre storage	1700	1700	20300	1700	1700	20300
108	Fuels and oil storage	330	330	1880	330	330	1880
109	Compressor station	234	234	1300	234	234	1300
110	Gas storage	290	290	1380	290	290	1380
111	Outdoor storage	1296	1296	13350	1296	1296	13350
112	Scrap dump	470	470	3730	470	470	3730
	Total	26192	26992	271190	26532	26672	274110

7.6. EFFECT OF BUILDING PROJECT ON ENVIRONMENT

Effects to Air

The following operations will affect the air:
- varnishing shop;
- welding shop;
- plating shop;
- foundry.

Amount of harmful substances from the varnishing shop loading the environment depends on the type of used paints. Their effects to the environment will be minimized by an efficient filtration system. Spraying boxes and driers will be fitted with exhausting. The operation in the welding shop will also be fitted with an efficient exhausting system.

The other operations - plating shop and foundry, are existing and they are fitted with corresponding device for air protection.

Vaste Vater

Origin of waste water oiled from the washing and cleaning of vehicles and waste water from the varnishing shop is assumed. Its liquidation will be performed by means of neutralization and deemulgation. Liquidation of existing waste water from the existing operations is ensured by means of neutralization.

Solid Vaste

Growth of waste is assumed for the projected reconstruction and expansion of the AKAKI plant. Solid waste will be stored in a separate building - store-house for waste. A part of usable waste will be recycled for the production consumption, the other waste

will be liquidated outside the plant.

Noise

The largest sources of noise in the expanded part of the plant will be a new compressor station and emergency power supplies in the mechanical and assembly operations. The other technical processes will affect the total noise level just minimally.

Lighting

Artificial lighting will be designed to comply with the given character of production. Sufficient day-time lighting will be ensured by means of the constructional design of individual buildings.

The values of noise and lighting in the corresponding operations are shown in the following table.

Noise and Lighting in the Plant Operations

Building	Name	Noise /dB(A)/		Lighting
		Inside	Outside	Intensity(lx)
7A	Expansion of garages & maintenance	65	40	400
101	Body & assembly building	75-85	50-55	400-1000
102	Hygienical & service addition	55	-	100-400
103	Production of el. instal. & upholstery	55	-	100-400
104	Repairs	75	50	100-600
105	Transfer hall	55	-	100-400
106	Central Mainten.	70	45	100-400
107	Store-house for tyres, wheels, batteries, charging	60-80	40-65	100-200
108	Store-house & distribution of fuels	60	40	100
109	Compressor station	105	75	100
115	Parking place	-	65	-

Other buildings in the expanded plant - store-house for gases. open stock, store-house for waste will not include permanent jobs and will not even be a source of increased noise.

The internal lighting will have the minimal level of 100 lx.

Description of Risks During Operation

Danger of explosion or fire exists in the store-houses for fuels, in the compressor station and in the workshops where combustible materials are stored.

When storing and manipulating with chemicals and oil products, leakage to the environment can occur. Preventive measures consist especially in the selection of a safe concept of a given process, in the construction design and in the system of technical processes control.

8. SCHEDULE OF REALIZATION

In case realization of the project is decided on, the following schedule can be expected for individual variants:

Activity	Variant			
	1	1A	2	2A
preparation of project documentation (year)	0.8	0.8	0.5	0.5
prepar. of constr. (year)	0.5	0.5	0.5	0.5
period of constr. (year)	4	4	4	4
duration of production start until achieving full capacity (year)	5	6	4	6

The particular production implementation curves are as follows:

Variant 1

year	1	2	3	4	5
number of cars	600	1300	2050	2500	3000

Variant 1A

year	1	2	3	4	5
number of cars	660	1300	2100	2800	3900

Variant 2

year	1	2	3	4
number of cars	330	900	1200	1500

Variant 2A

year	1	2	3	4	5	6
number of cars	660	1250	2050	2500	2900	3000

9. HUMAN RESOURCES AND ORGANIZATION

9.1. PROFESSIONAL QUALIFICATION

To ensure production, a program of qualification training courses for the individual sub-systems of production will have to be prepared and realized. Professional requirements comply with the character of performed activities. They especially include skills in the field of machining, machine adjustment, operation of NC machines, checking of intermediate operation outputs, operation of welding and varnishing systems, repairs of electric devices, etc.

The technical & administration workers have to possess the usual knowledge in the field of management of vehicles production.

Knowledge of production is assumed to be acquired in two ways:
- in the form of foreign stays for selected, approximately 50 workers for a period of about six months;
- in the form of supervision performed by foreign professionals during production (about 35 specialists).

Training of workers in the plant in the form of foreign stays is assumed for the following professions:

- management;
- technology;
- designing;
- technical control;
- mechanical production;
- assembly & body system - sub-system;
- thermal treatment;
- organization of the production control;
- attendance to the production machinery;
- adjustment;
- maintenance of mechanical and electrical machine parts.

During the start of construction attendance of foreign specialists in the following functions will be required:

- management (marketing, economy, etc.);
- technique of
  - production;
  - foundry work;
  - forging;
  - thermal treatment;
- designing of
  - tools and crates;
  - production;
- quality control
  - mechanical production;
  - assembly & body;
  - metallurgic sub-systems;
- production
  - machine adjustment;
  - verifying of techniques;
- store system control.

9.2. MANAGEMENT SYSTEM

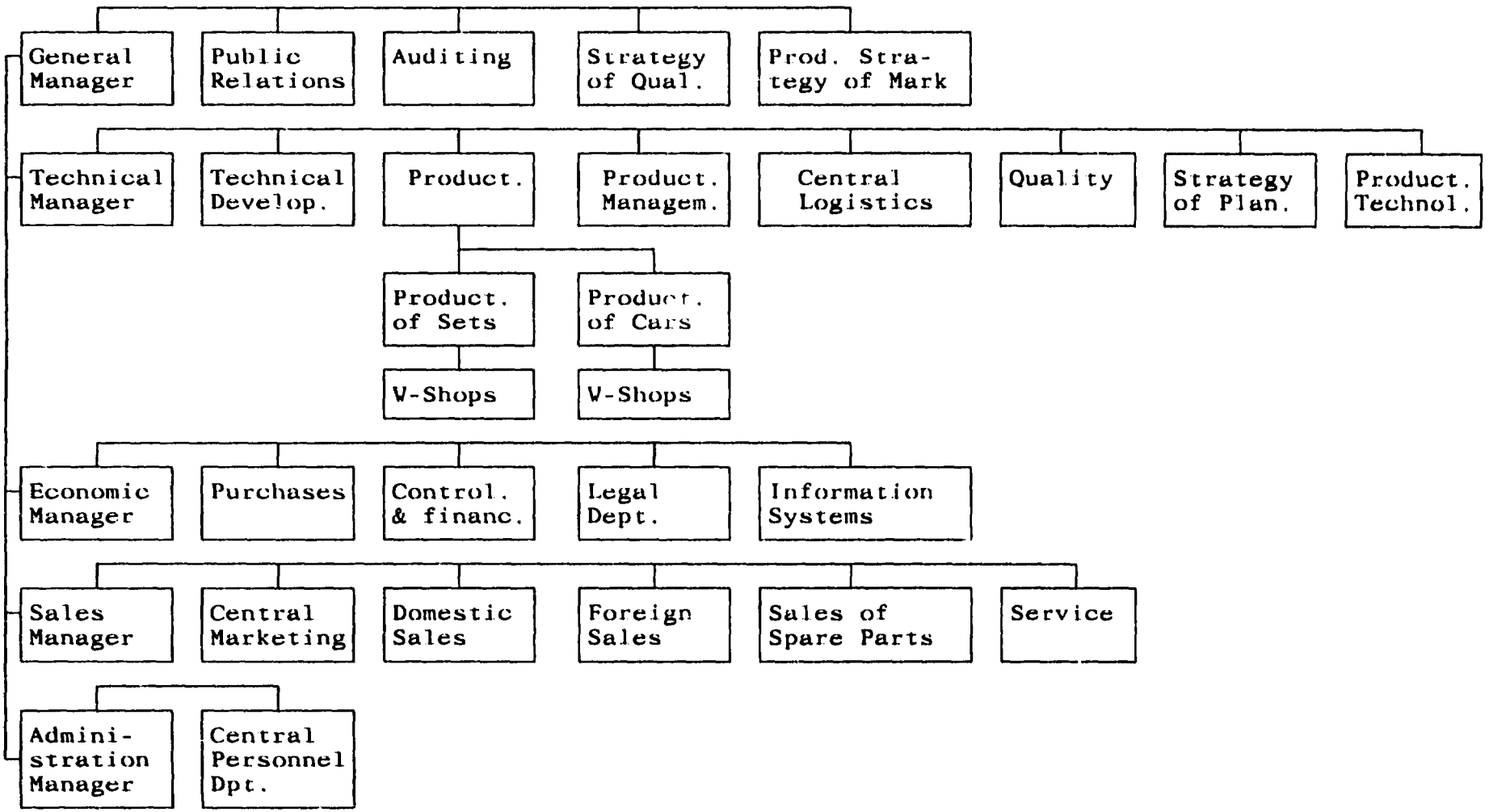
The proposed production system assumes the application of an automated management system, especially in the field of production and storage.

The particular contents of the system will be determined at the preparation of the other phases of the project.

9.3. ORGANIZATION STRUCTURE

The system of management in AKAKI for all designed variants is as follows:

DRAFT OF THE OVERALL SYSTEM OF ORGANIZATION AND MANAGEMENT



9.4. HUMAN RESOURCES

The following number of employees in the individual sub-systems is assumed for production of vehicles:

Section - Category	Number of Workers			
	VARIANT			
	1	1A	2	2A
Mechanical production	222	371	122	222
including production workmen	145	250	73	145
overheads workmen	63	100	33	63
Forge	20	39	10	20
Hardening shop	24	45	12	24
Foundry	40	70	20	40
Body & Assembly production	552	968	283	552
including production workmen	356	648	178	356
overheads workmen	151	257	79	151
Upholstery & el. installation	40	67	20	40
Central maintenance	24	43	12	24
Store-house for sub-supplies, oils, combustible matters, waste & gases	40	70	20	40
Tyres and batteries	9	15	5	9
Other	129	212	65	129
TOTAL	1100	1900	569	1100
including production workmen	595	1078	298	595
overheads workmen	357	612	197	357
technical & admin. workers	148	210	74	148

10. FINANCIAL AND ECONOMIC ANALYSIS

10.1. INPUT DATA AND ASSUMPTIONS

The economic and financial analysis of production of road vehicles in the Ethiopian company - ASPF is prepared using the software COMFAR version 2.1 and based on the initial economic data and assumptions.

Because of the present disconsolate financial situation of ASPF, i.e. losses resulting especially from the low utilization of production capacities, the financing of the business plan being analyzed is fully covered by a credit.

The investment credit is divided into a foreign part and a domestic part. Government guaranty is assumed for both.

The foreign loan has the following credit terms:

a) interest rate 11% p.a.
b) repayment period 4 years
c) grant period 4 years
d) repayment in the form of annual fixed payments

The foreign loan is designed especially for the financing of imports of the production machinery, training of production workers abroad and supplies of imported components for production of trucks.

The amount of the foreign credit in the individual variants is as follows:

Variant	1	1A	2	2A
inv. credit (th. USD)	69 000	70 000	42 000	43 000

The domestic investment credit has the following credit terms:

a) interest rate 14% p.a.
b) repayment period 6 years
c) grant period 4 years
d) repayment in the form of annual fixed payments

The credit provided by domestic banks is designed especially for the financial needs related to the construction of production and auxiliary buildings, purchase of land and domestic primary sub-supplies.

The amount of the domestic credit in the individual variants is as follows:

Variant	1	1A	2	2A
inv. credit (th. USD)	53 000	55 600	38 440	40 480

The variants 1 and 1A also consider a use of overdraft in the first year of operation to cover the expenses connected with purchases of both imported and domestic components for the produced truck, amounting to USD 3,300 thousand with the repayment period of one year and interest rate of 13% p.a.

The construction period of the investment being analyzed is four years in total, start of operation in the case of all variants is expected at the beginning of the fourth year of construction.

Valuation of all costs and income is prepared in US Dollars. The official exchange rate between the domestic currency and the calculation currency, i.e. US$, is:

1 US$ = 5 ETB

The following depreciation and tax rates were used in the calculation:

a) depreciation rates

- buildings and land surfacing	5 %
- machinery	6.67 %

b) tax rates

- tax on profits	5.5 %
- tax on sales	12 %
- pension insurance of workers	6 %
- tax exemption	3 years

The annual rate of inflation is assumed to be 5%.
The price of land is US$ 0.2 per square meter.
The price of electric power is US$ 0.05 per kVh.
The average annual wages of foreign experts are assumed in the amount of US$ 100,800.
The average annual wages of domestic workers are US$ 1,100.
The maximal number of foreign experts will be required at the start of operation and amounts to 35. Then a fixed number of 5 foreign experts is assumed. The selling prices of vehicles are assumed in a dual form, namely domestic ones and export ones. The domestic price of vehicles is calculated in the amount of US$ 60,850. The export price of vehicles is calculated to be US$ 67,900.

The initial structure of the annual standard production costs used in the calculation for the Variant 1 is as follows:

	local (10^3USD)	foreign (10^3 USD)
Raw material (a)	47,570	43,700
Raw material (b)	10,510	0
Utilities	3,940	0
Energy	185	0
Labour (direct)	850	360
Maintenance	1,450	0
Spares	80	240
Factory overheads	5,100	0
Administration, labour cost	350	0
Administration, non-labour cost	2,360	0
Marketing, labour cost	170	0
Marketing, non-labour cost	540	0
Total	72,935 10^3 USD	44,300 10^3 USD

The economic analysis is calculated for the discount rate of 11.5%.

10.2. ANALYSIS OF RESULTS

The following table summarizes basic indicators of the economic effectivity of the analyzed variants.

Variant	1	1A	2	2A
Total investment costs	122,000	125,600	80,440	83,480
Net present value (NPV)	55,123.2	111,555.0	4,531.7	83,110.48
Internal rate of return (IRR)	16.6 %	19.3 %	12.22 %	21.39 %
Return on equity 1 (ROE 1)	61.37 %	59.13 %	36.49 %	92.93 %
Return on equity 2 (ROE 2)	20.98 %	25.07 %	13.08 %	30.14 %
Pay back period	6 years	6 years	9 years	5 years
Break even for 5^{th} pr.year	34 %	34 %	48 %	30 %
Nominal production	3,000	5,000	1,500	3,000

The table indicates that all four variants feature a positive NPV value with the used discount rate of 11.5%, therefore they are feasible. The lowest effectivity is featured by the Variant 2. The NPV value is US$ 4,531.7 thousand, however, the IRR is lower rather than the interest rate of the domestic credit. The return period for the capital expenditure is also rather long, namely nine years.

The derived Variant 2A, however, features the highest IRR value, namely 21.39%. The return period of the capital expenditure is also the shortest from all analyzed variants, namely five years. The NPV value is US$ 83,110.5 thousand.

The highest NPV value is achieved with the Variant 1A, which is derived from the basic Variant 1.

The NPV of this variant reaches US$ 111,550. This variant also has the highest capital expenditure. The IRR is 19.3% and the

return period is six years.

The Variant 1 features the NPV of US$ 55,123.2 thousand for the time of realization and the IRR of 16.6% with the return period of the capital expenditure of six years.

The comparison indicates that the Variants 1, 1A and 2A seem to be economically interesting. The Variant 2 - production of 1,500 trucks per year, is at the limit of effectivity. The Variant 2A represents the variant with the highest IRR and the shortest return period, however the NPV is by US$ 28,444.5 thousand lower rather than in the case of the Variant 1A. The Variant 2A also includes a significant risk regarding the realization of nominal production, which is derived from the assumption of the full utilization of a two-shift operation. To provide for a two-shift operation in local conditions can be very problematic.

This risk is included also in the Variant 1A, which reaches the absolutely highest value of the NPV and the second highest value of the IRR. The risk is, however, lower, since this variant of the business plan is not based on the assumption of the full utilization of a two-shift operation.

The Variant 1, which represents production of 3,000 trucks in a one-shift operation, is the most stable one regarding the realization of nominal production. The economic indicators of effectivity of the capital expenditure are relatively favourable, since the value of the NPV is US$ 55,123.2 thousand, the IRR = 16.6% and the return period of the capital expenditure is same as that of the Variant 1A.

Tables of results and graphical outputs of the economic indicators of the analyzed variants are given in the appendix.

The results of the sensitivity analysis indicate the existence of a relatively significant dependance of economic indicators of the

individual variants on a change in variable costs and sales. A lower sensitivity of economic indicators appears in the case of a change of investment expenditure, and the lowest effect is featured by the discount rate. In the case of the Variant 1, for example, which has been analyzed in most details, an increase in capital expenditure by 50% of the basic value results in a decrease in the value of the interest rate at which the investment plan is profitable, from 16.6% down to 12.5%, i.e. by 25%.

A decrease in the sales by 10%, however, results in a decrease in the above mentioned interest rate to the value of 5.7%, i.e. by 290%.

Similarly, an increase in the operating costs by 10% results in a decrease in the profitability of the investment for the interest rate of 8.9%, i.e. by 187%.

Based on the economic and financial analysis as well as the sensitivity analysis and evaluation of risks and uncertainties, the Variants 1 and 1A can be recommended to be further analyzed in more technical and economic details. These variants require higher capital expenditure, however, regarding the realism of achieving the nominal projected production and, subsequently, the sales, they are the least risky.

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.1

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111090.00	51.931 % foreign
current assets:	450.00	100.000 % foreign
total assets:	111540.00	52.125 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	69000.00	
local loans :	53000.00	
total funds :	122000.00	56.557 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	36316.10	142053.00	177675.80
depreciation :	6293.14	6788.59	6788.59
interest :	7420.00	5607.50	0.00
production costs	50029.24	154449.10	184464.30
thereof foreign	29.48 %	39.13 %	39.53 %
total sales :	40161.00	229603.00	293038.00
gross income :	-14608.24	50540.86	83722.25
net income :	-14608.24	22743.39	37675.01
cash balance :	-30296.55	-3751.97	42621.45
net cashflow :	-22876.55	27938.86	42621.45

Net Present Value at: 11.50 % = 55123.19
Internal Rate of Return: 16.60 %
Return on equity1: 61.37 %
Return on equity2: 20.98 %

Index of Schedules produced by COMFAR

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.1A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111590.00	52.146 % foreign
current assets:	450.00	100.000 % foreign
total assets:	112040.00	52.338 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	70000.00	
local loans :	55600.00	
total funds :	125600.00	55.732 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	42951.34	184613.70	288133.10
depreciation :	6326.64	6984.59	6984.59
interest :	0.00	5817.00	0.00
production costs	49277.98	197415.30	295117.70
thereof foreign	29.81 %	38.28 %	39.54 %
total sales :	39897.00	294817.90	485526.80
gross income :	-14120.98	66245.19	149398.60
net income :	-14120.98	29810.34	67229.35
cash balance :	-33313.30	-3484.31	71223.34
net cashflow :	-33313.30	29099.34	71223.34

Net Present Value at: 11.50 % = 111555.90
Internal Rate of Return: 19.30 %
Return on equity1: 59.13 %
Return on equity2: 25.07 %

Index of Schedules produced by COMFAR

Total initial investment
Total investment during production
Total production costs
Working Capital requirements
Cashflow Tables
Projected Balance
Net income statement
Source of finance

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	74460.00	42.479 % foreign
current assets:	350.00	100.000 % foreign
total assets:	74810.00	42.748 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	42000.00	
local loans :	38440.00	
total funds :	80440.00	52.213 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	20706.98	75747.76	94384.59
depreciation :	4082.06	4195.14	4195.14
interest :	5381.60	3845.80	0.00
production costs	30170.64	83788.70	98579.73
thereof foreign	26.69 %	37.67 %	38.09 %
total sales :	20080.50	113944.60	145425.30
gross income :	-12520.14	18096.74	34632.00
net income :	-12520.14	8143.53	15584.40
cash balance :	-18402.26	-5664.50	18816.39
net cashflow :	-13020.66	15087.96	18816.39

Net Present Value at: 11.50 % = 4531.70
Internal Rate of Return: 12.22 %
Return on equity1: 36.49 %
Return on equity2: 13.08 %

Index of Schedules produced by COMFAR

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2 A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	76300.00	43.145 % foreign
current assets:	350.00	100.000 % foreign
total assets:	76650.00	43.405 % foreign

Source of funds during construction phase

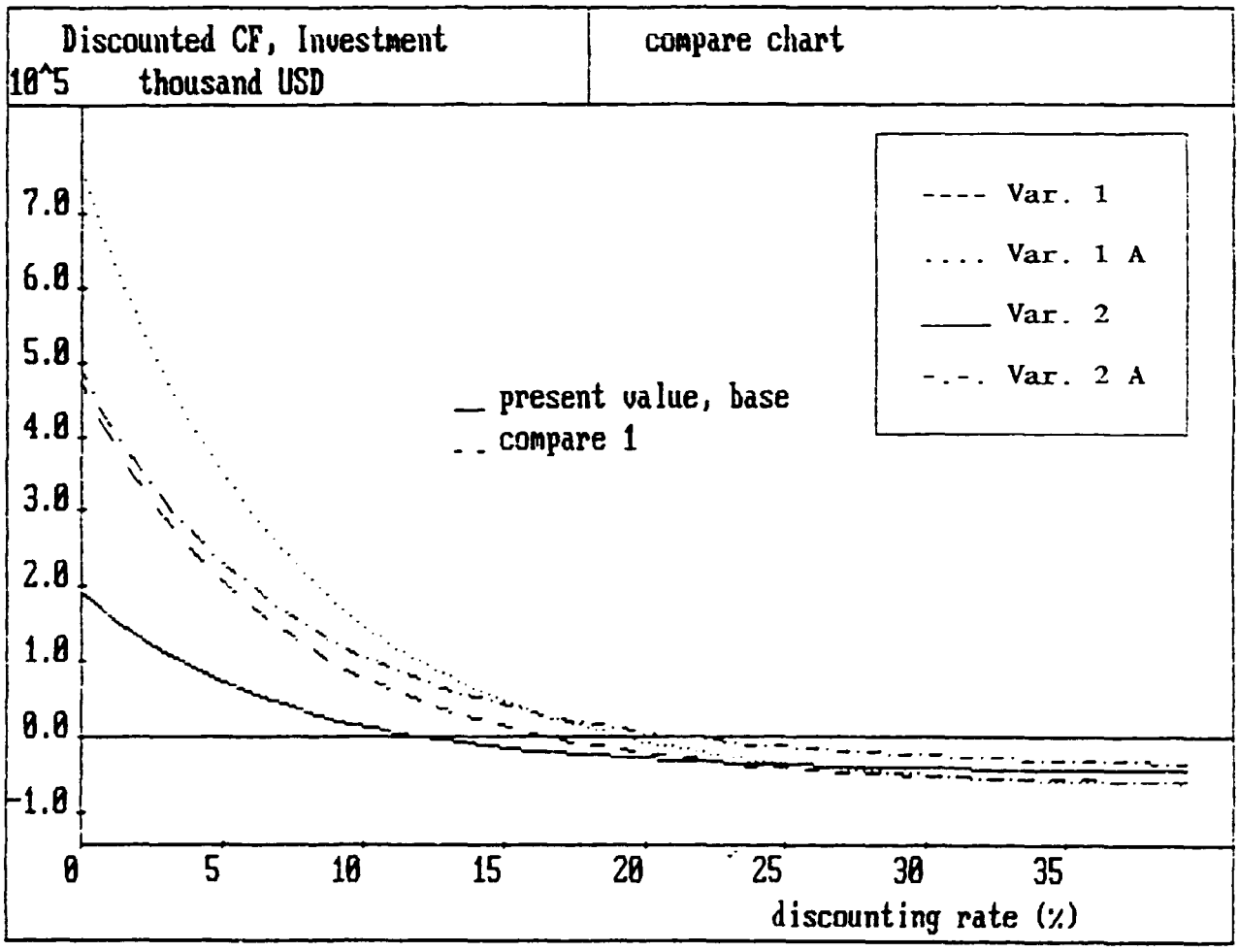
equity & grants:	0.00	0.000 % foreign
foreign loans :	43000.00	
local loans :	40480.00	
total funds :	83480.00	51.509 % foreign

Cashflow from operations

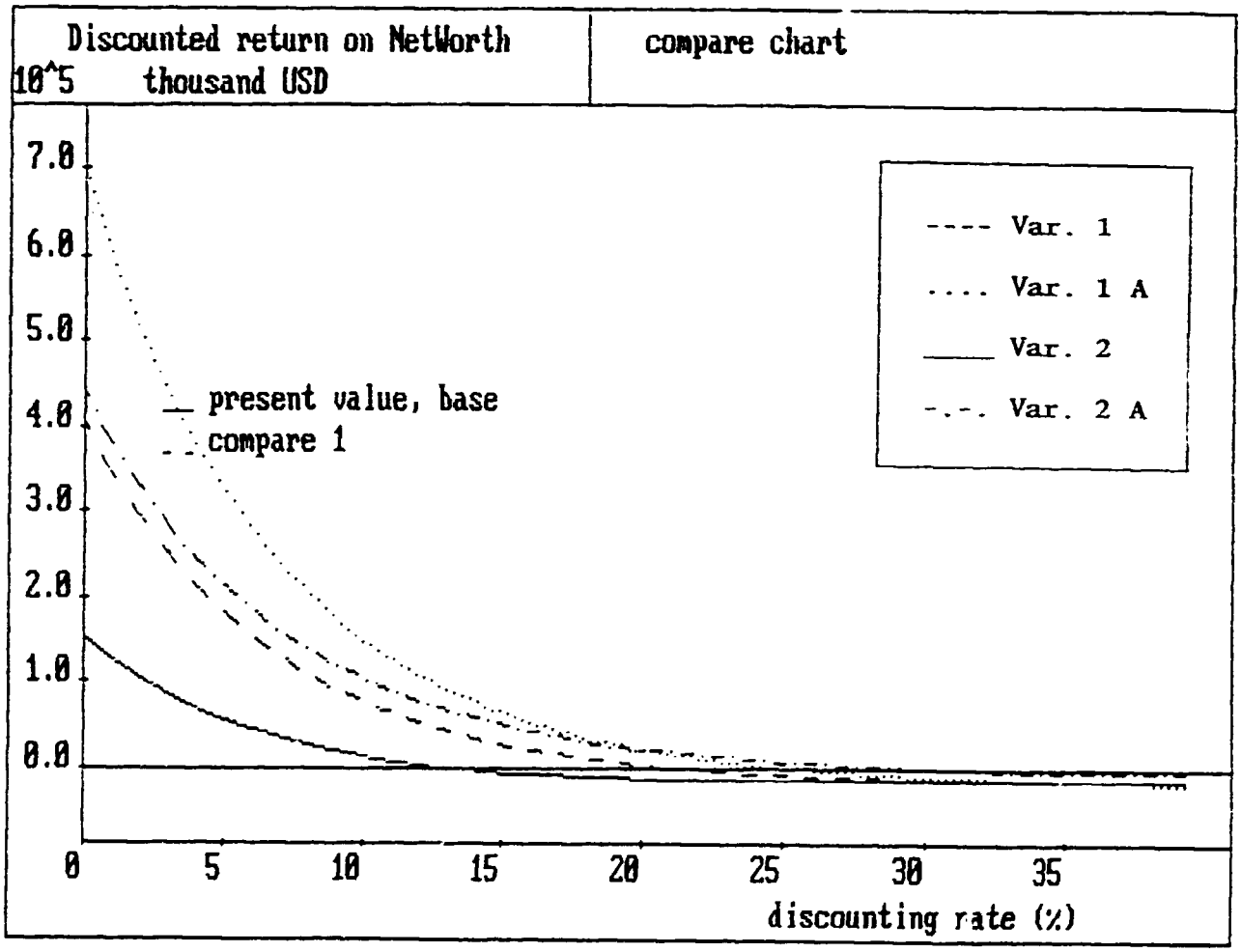
Year:	1	9	10
operating costs:	36316.10	137843.70	177675.80
depreciation :	4195.99	4379.27	4379.27
interest :	5667.20	4016.10	0.00
production costs	46179.29	146239.10	182055.00
thereof foreign	28.43 %	38.48 %	39.09 %
total sales :	40161.00	222296.70	293038.00
gross income :	-10758.29	53051.83	86131.56
net income :	-10758.29	23873.32	38759.20
cash balance :	-21263.75	4725.03	41296.33
net cashflow :	-15596.55	26237.80	41296.33

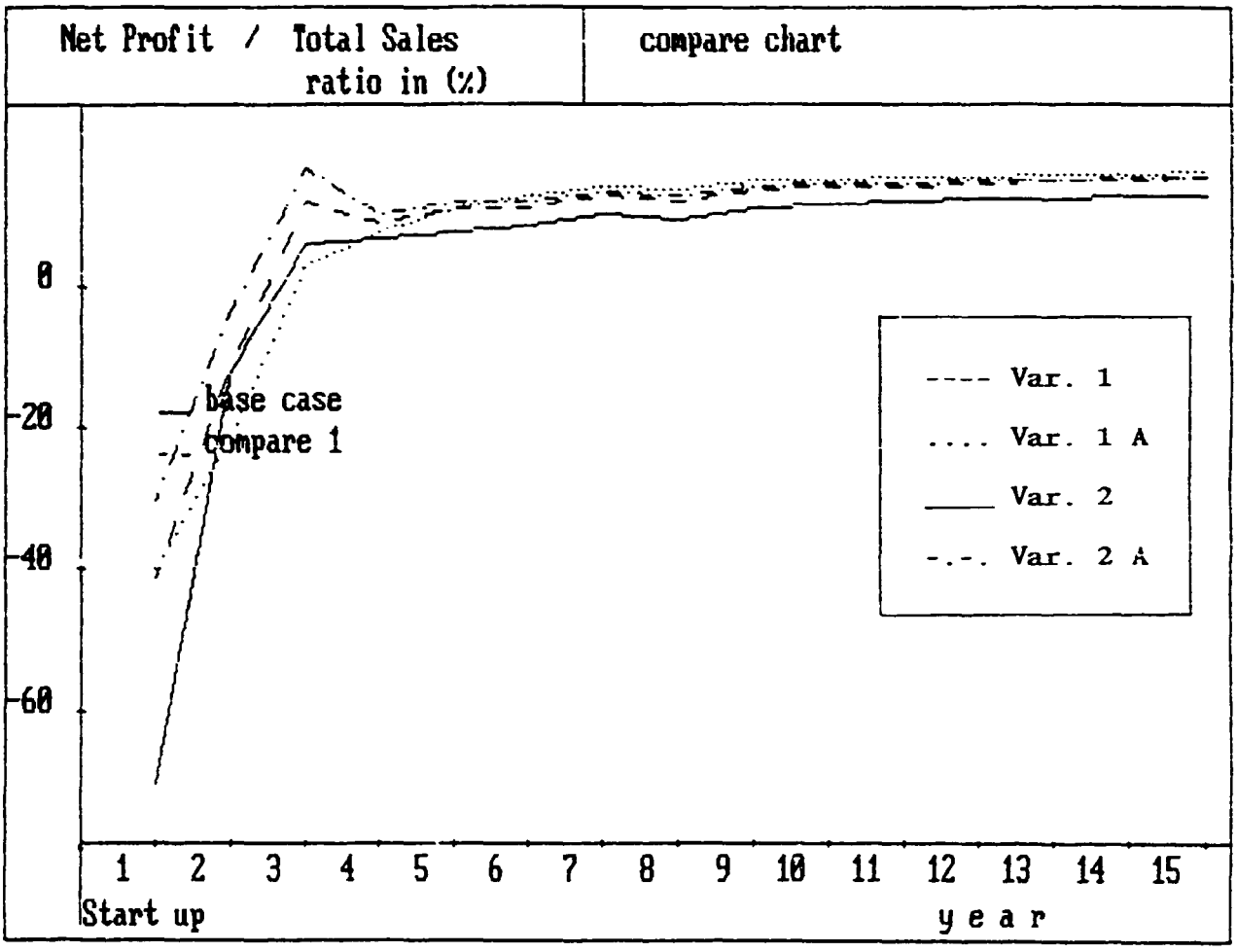
Net Present Value at: 11.50 % = 83110.48
Internal Rate of Return: 21.39 %
Return on equity1: 92.93 %
Return on equity2: 30.14 %

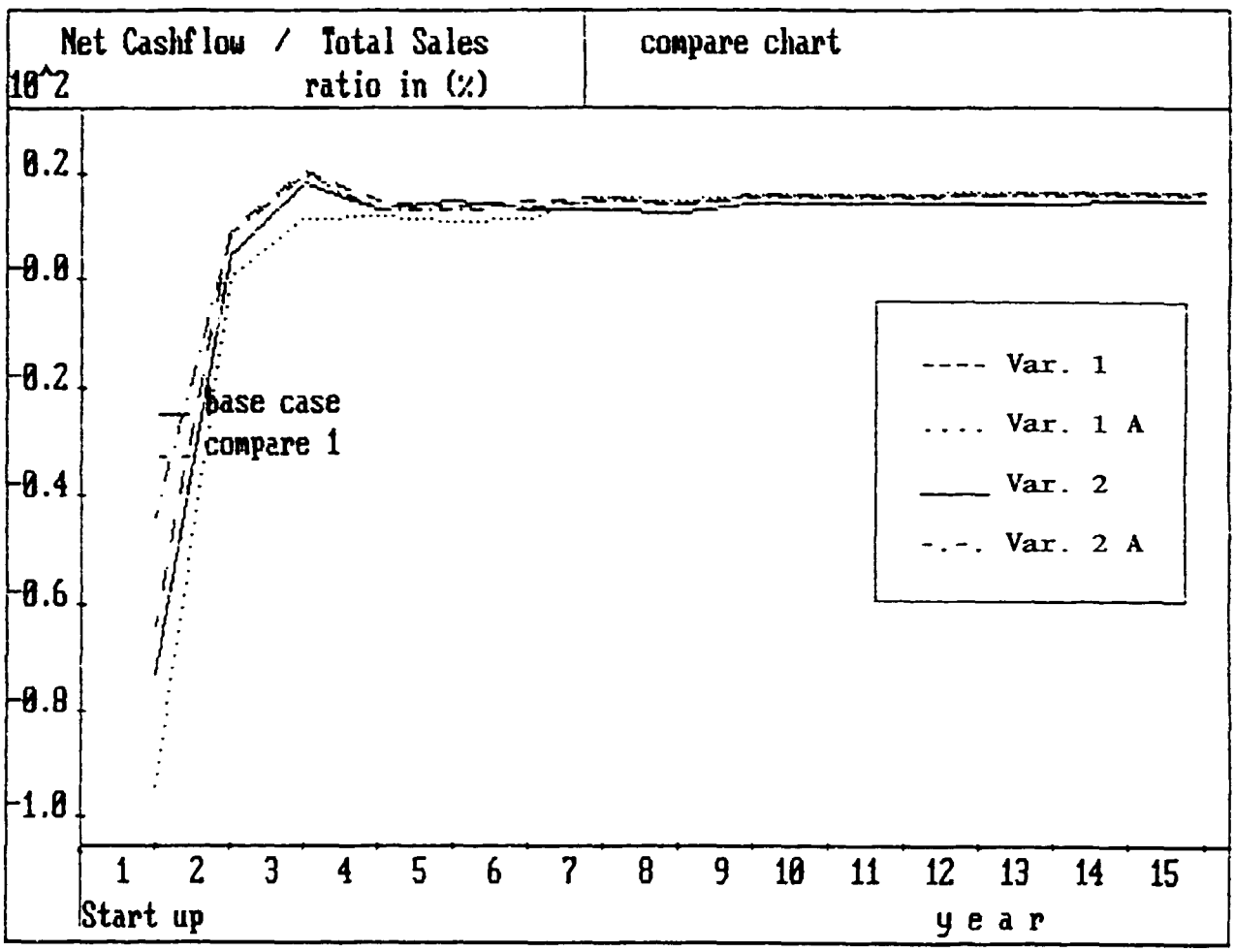
Index of Schedules produced by COMFAR

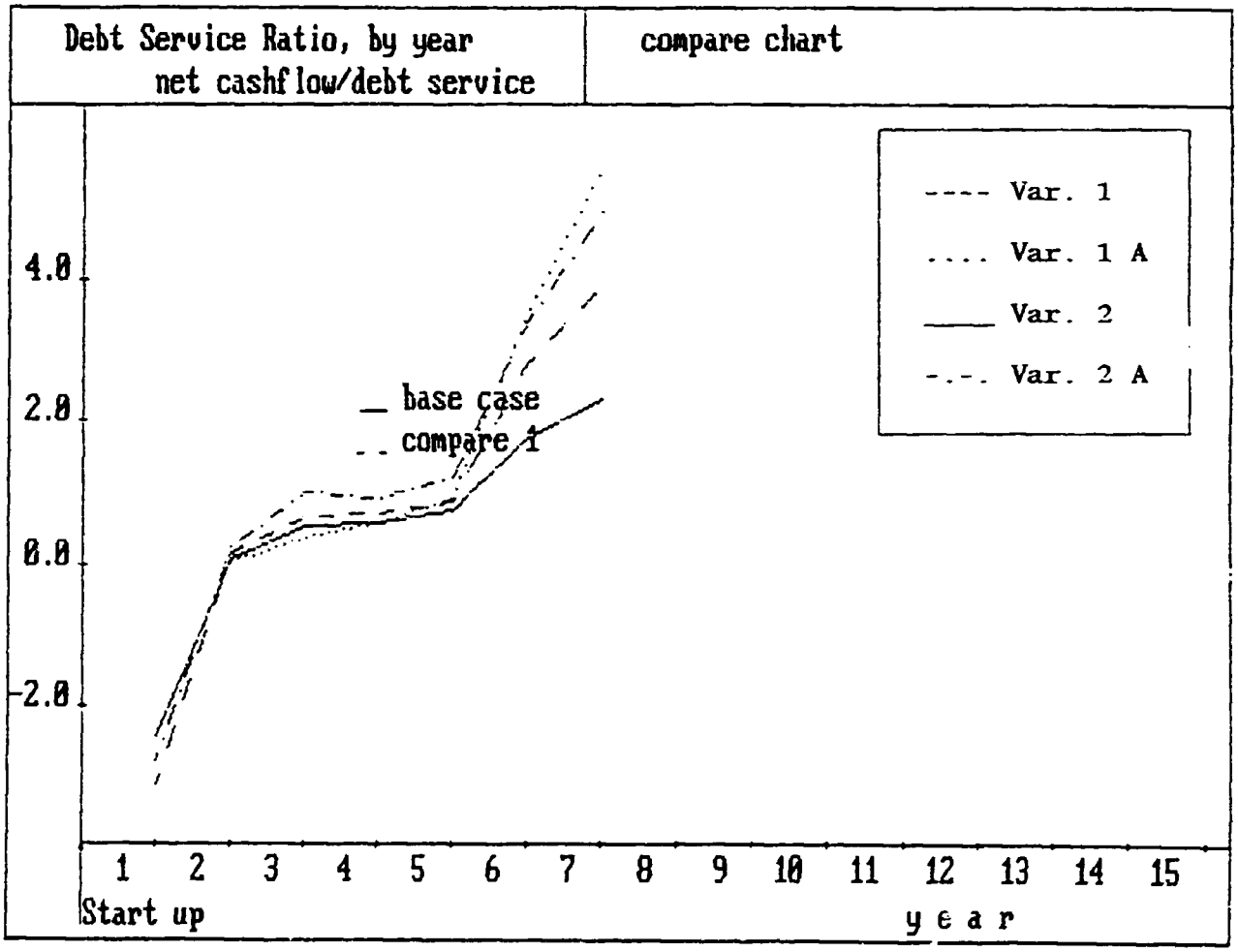

Discounted CF, Investment
10^5 thousand USD
compare chart
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
__ present value, base
_ _ compare 1
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
0
5
10
15
20
25
30
35
discounting rate (%)


COMFAR
2.1 UNIDO


Discounted return on NetWorth
10^5 thousand USD
compare chart
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
present value, base
compare 1
Var. 1
Var. 1 A
Var. 2
Var. 2 A
0
5
10
15
20
25
30
35
discounting rate (%)

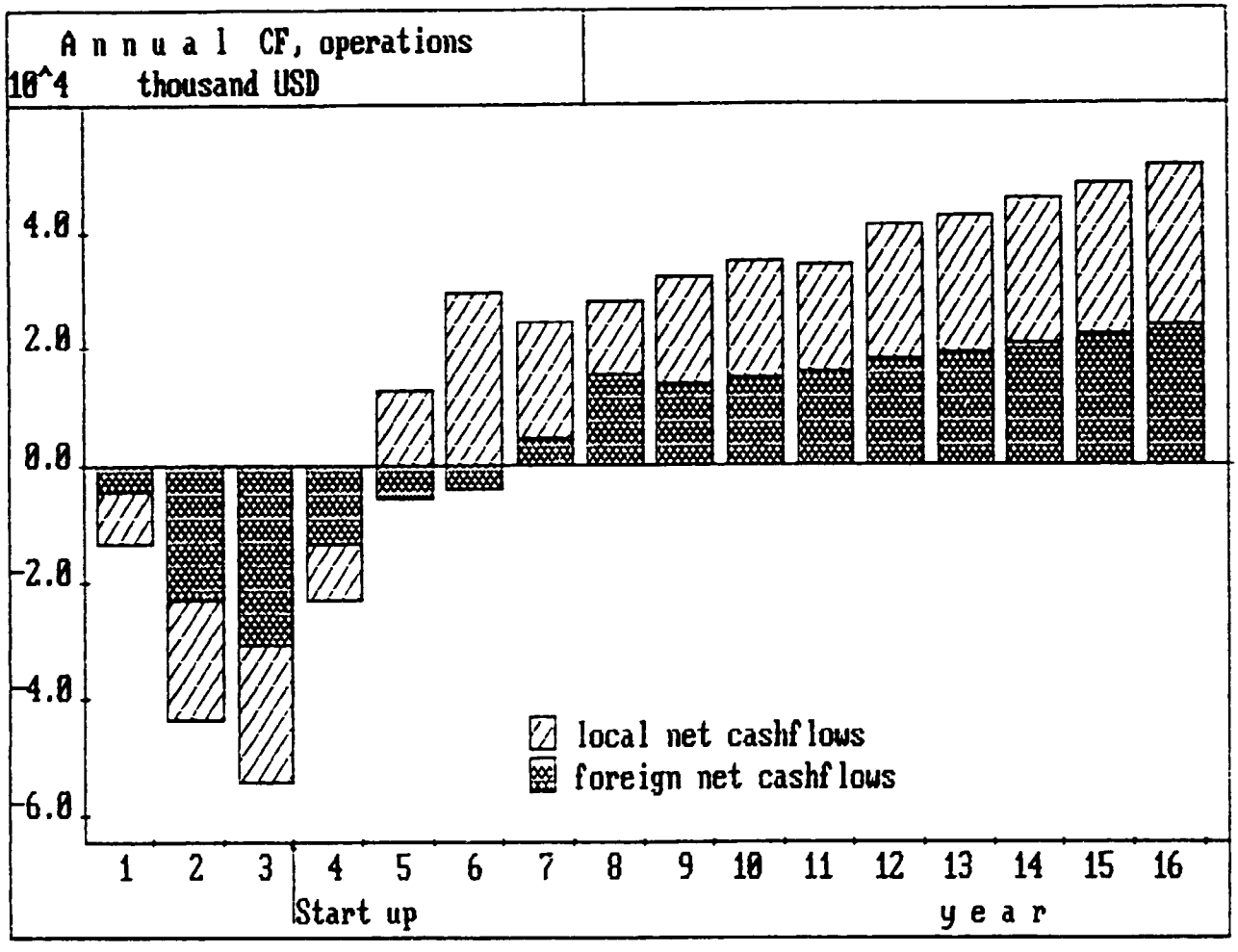

Net Profit / Total Sales ratio in (%)
compare chart
0
-20
-40
-60
base case
compare 1
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

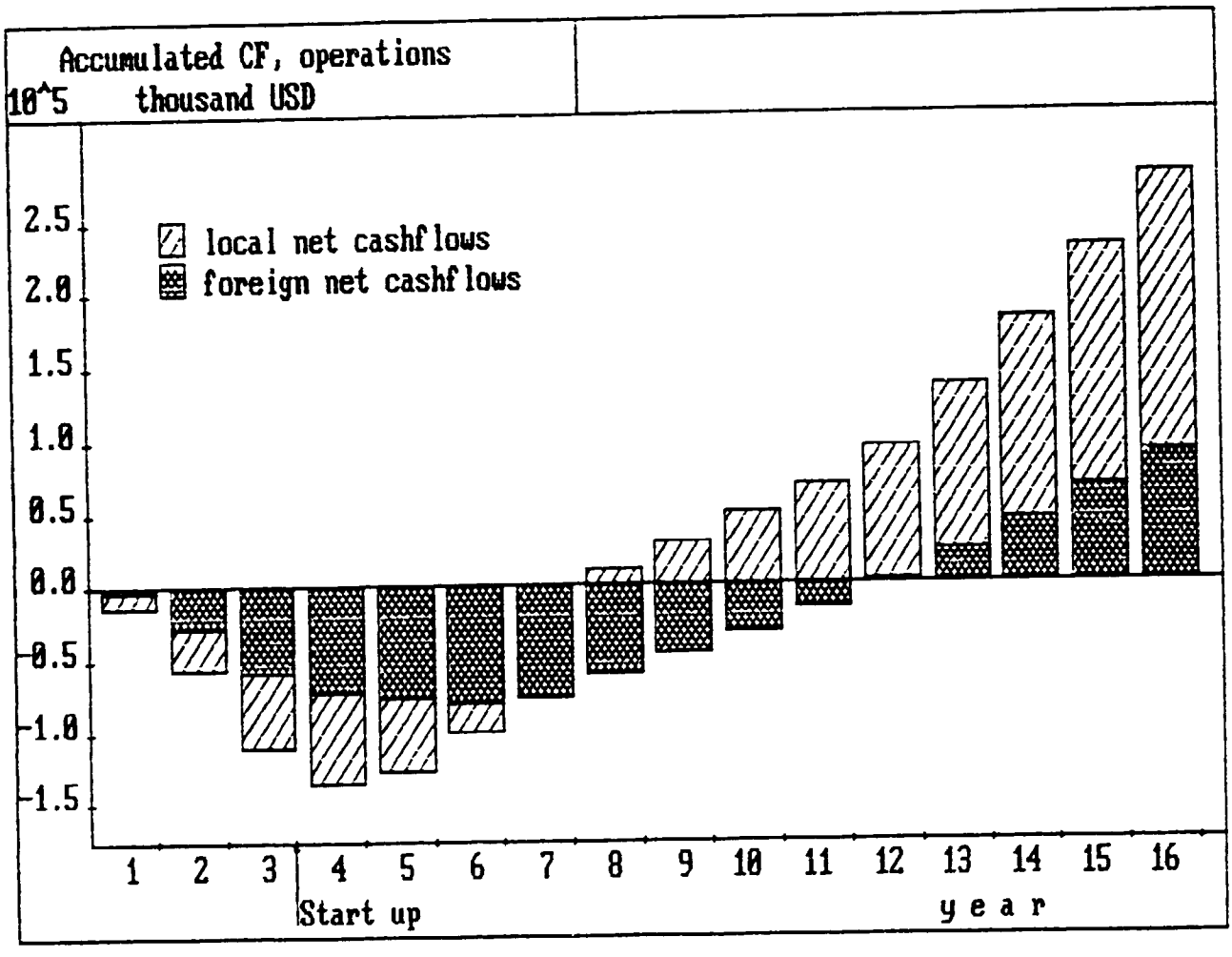

Net Cashflow / Total Sales
10^2 ratio in (%)
compare chart
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
base case
compare 1
---- Var. 1
.... Var. 1 A
____ Var. 2
-.-. Var. 2 A
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

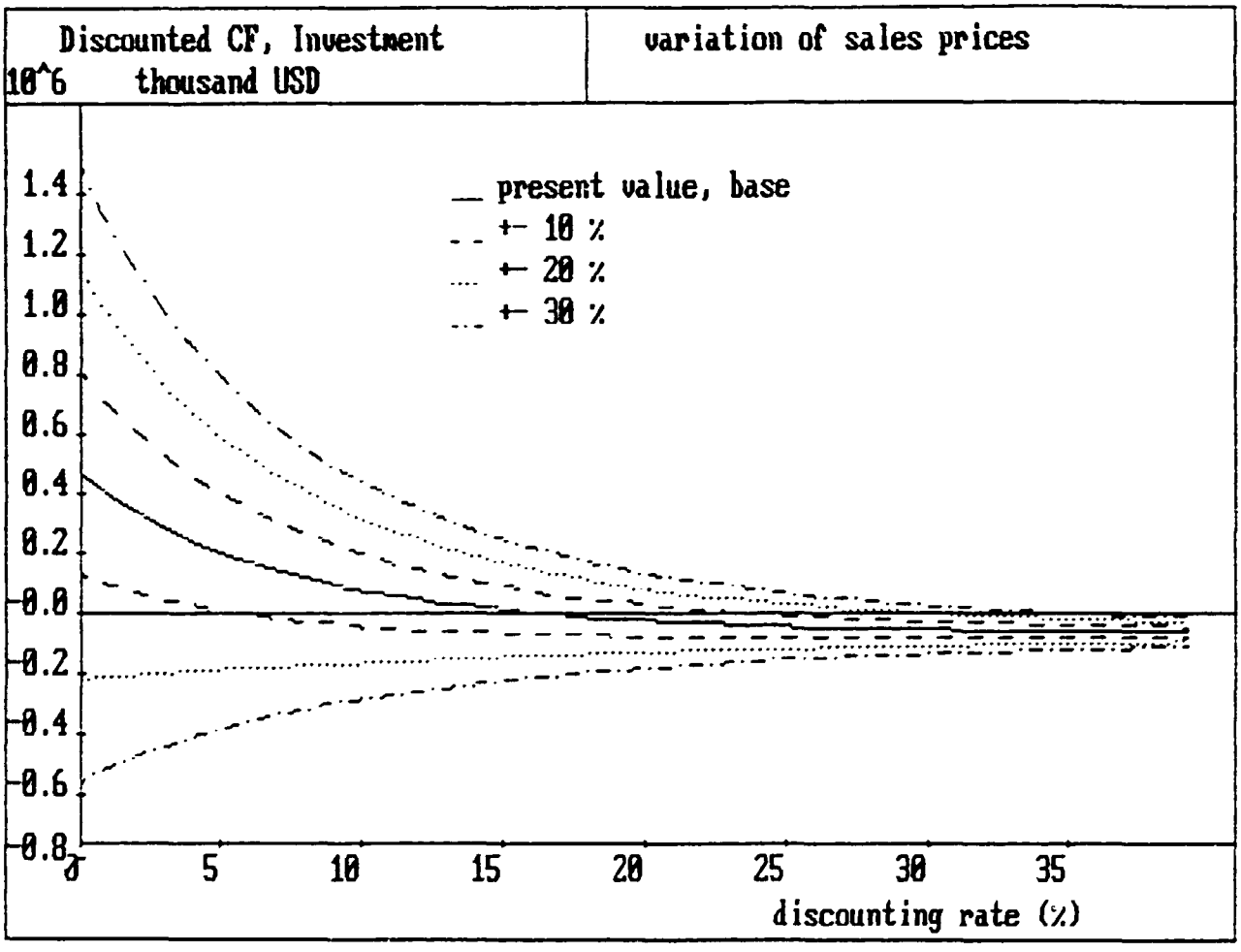

Debt Service Ratio, by year
net cashflow/debt service
compare chart
Var. 1
Var. 1 A
Var. 2
Var. 2 A
4.0
2.0
0.0
-2.0
base case
compare 1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

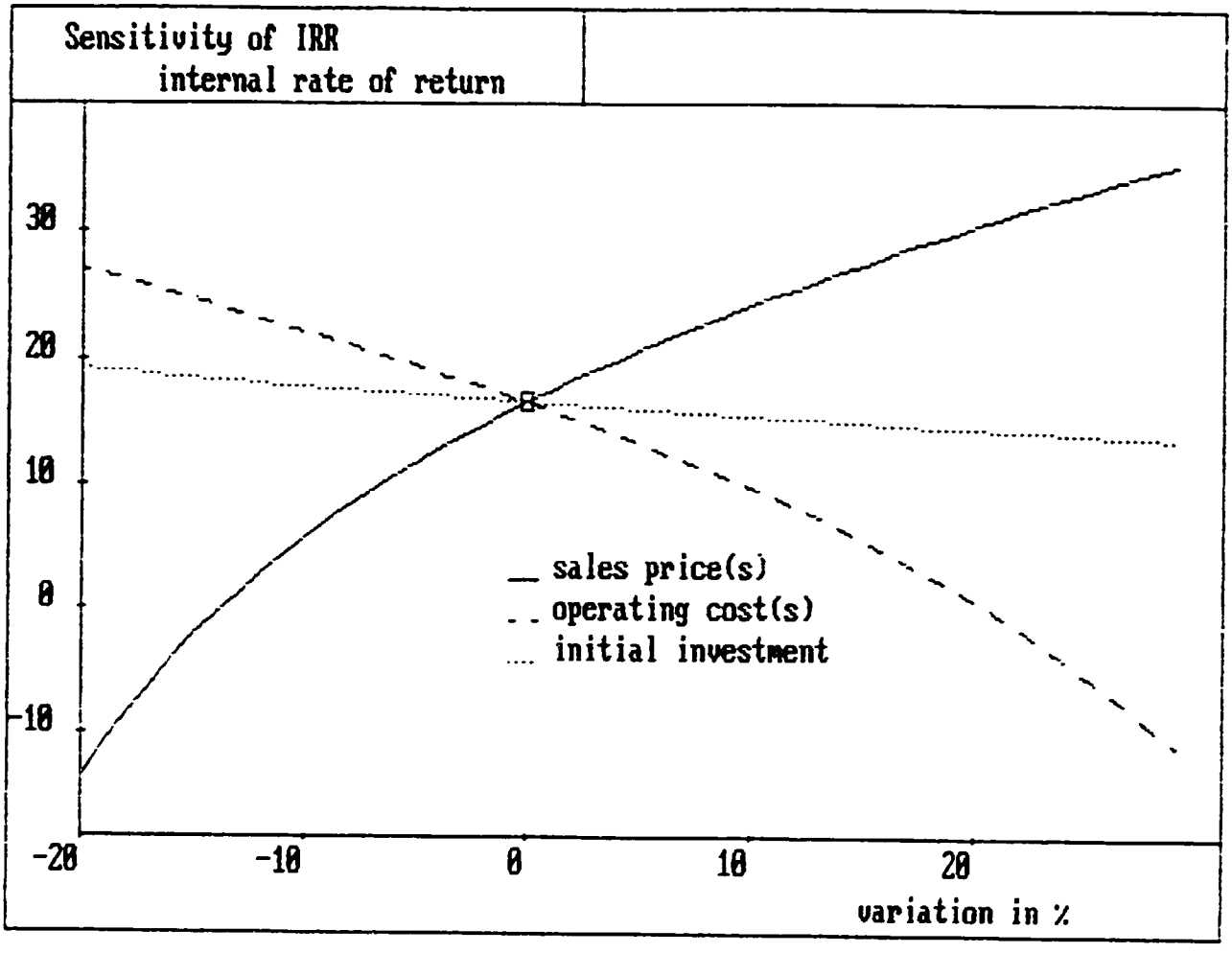
COMFAR 2.1 UNIDO

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA



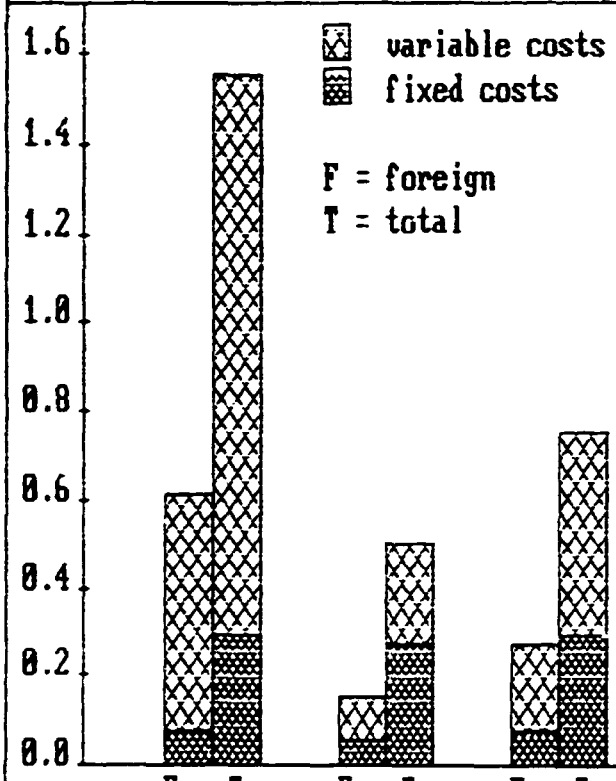

Accumulated CF, operations
10^5 thousand USD
local net cashflows
foreign net cashflows
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year


Discounted CF, Investment
variation of sales prices
10^6 thousand USD
present value, base
+- 10 %
+- 20 %
+- 30 %
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.2
0.4
0.6
0.8
0
5
10
15
20
25
30
35
discounting rate (%)

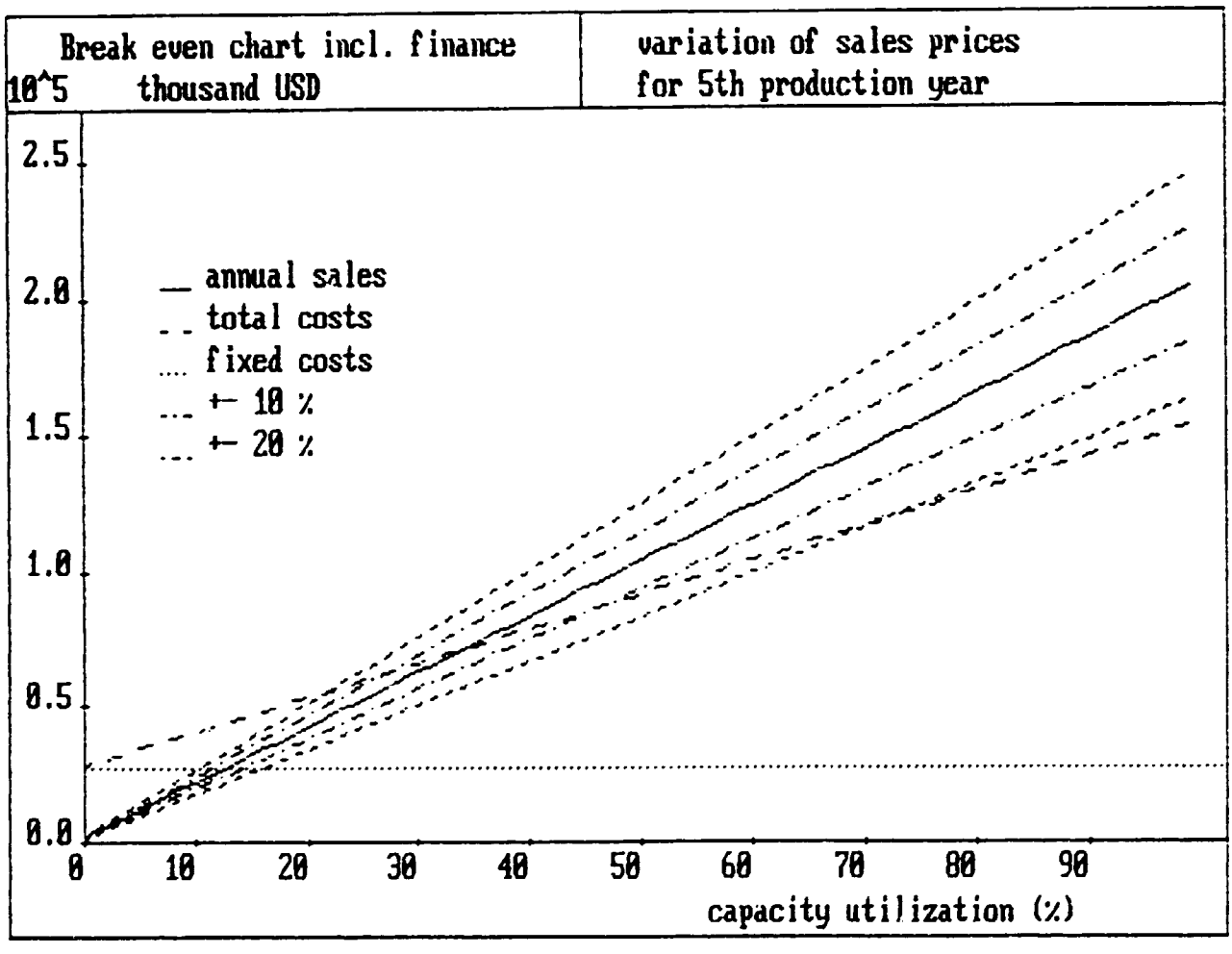

Sensitivity of IRR
internal rate of return
30
20
10
0
-10
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment

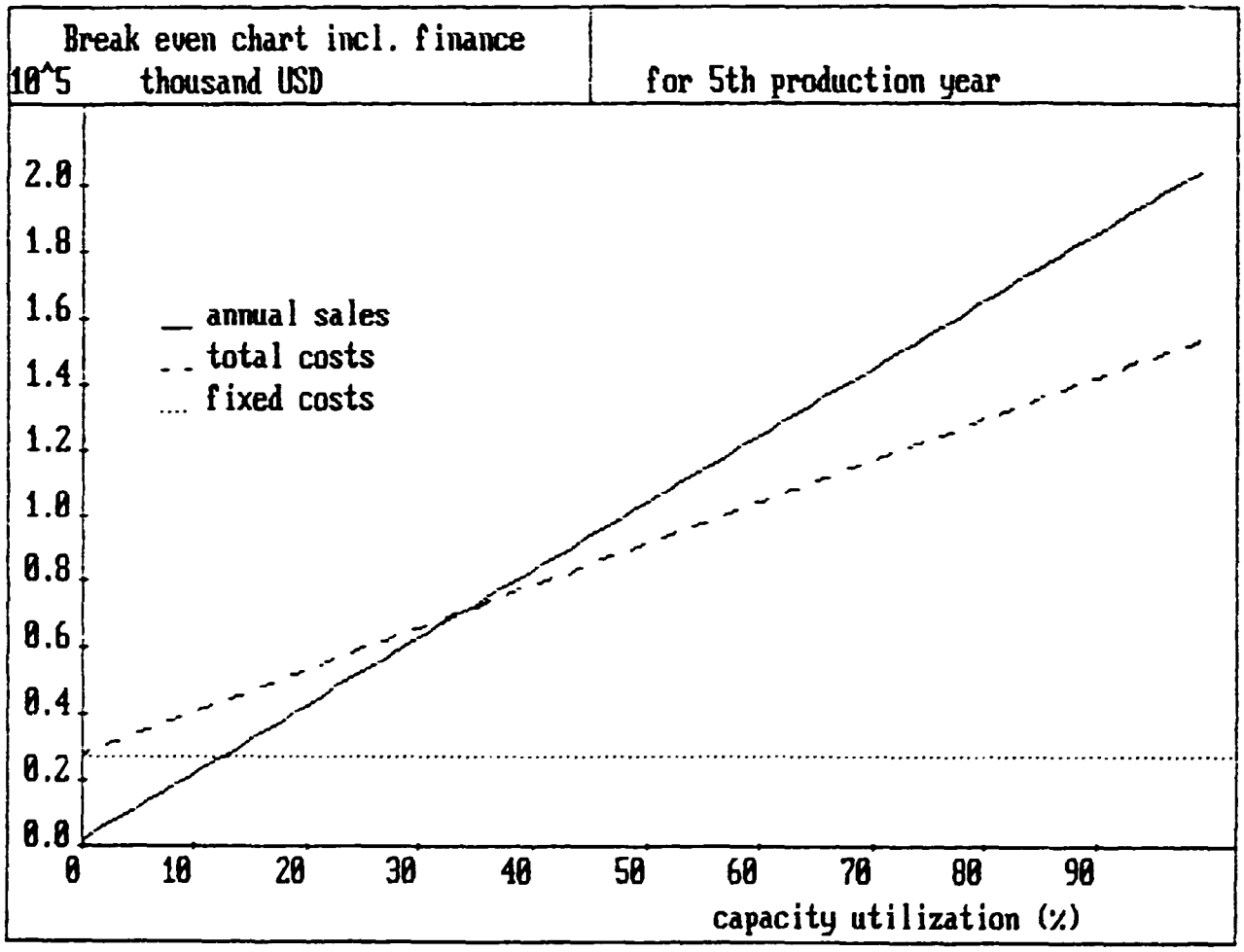
Structure of Production Costs
10^5 thousand USD

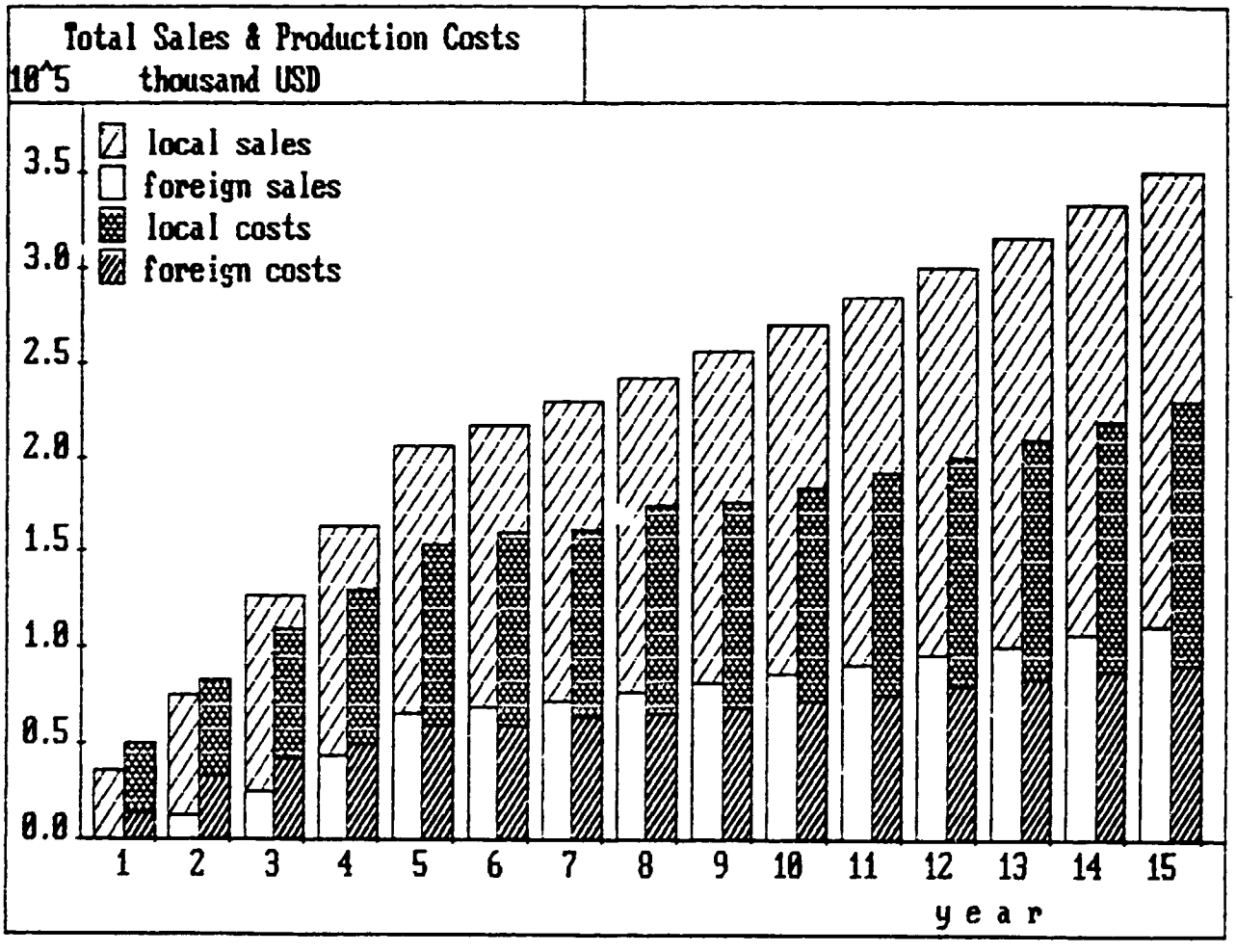
for 5th production year



Nominal	Start up	
71.43	39.91	raw material
6.77	4.60	other RM
3.08	4.17	utilities
0.14	0.20	energy
0.95	3.31	labour
1.13	2.43	maintenance
0.59	0.64	spares
7.92	17.49	overheads
4.37	12.51	depreciation
3.61	14.75	interest
100.00	100.00	Total Prod C.


Break even chart incl. finance
10^5 thousand USD
variation of sales prices
for 5th production year
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)




Total Sales & Production Costs
10^5 thousand USD
local sales
foreign sales
local costs
foreign costs
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
year

11. CONCLUSION AND PRACTICAL RECOMMENDATIONS INCLUDING RISK

The prepared pre-feasibility study has proved the correctness of the idea on the effectivity of production of vehicles directly in the region with maximal own production of components for the final product. The market with road vehicles in the region is clearly unsaturated in all segments.

The problem of unsaturation is, however, connected with the level of economic and social systems in the countries of the region. The volumes of GNP as well as other specific indicators are at a very low level.

The political stability in the region is also relatively low.

Therefore, the only stabilized factor seems to be the trend of growth of the number of inhabitants. The average annual increment in Ethiopia reaches the value of 3.1%. At least this fact will inevitably affect the growth of the market demand for trucks. Another inevitable fact is that to deal with development at the market with passenger cars is useless under this situation. Therefore, the attention was concentrated just to the market with trucks, regarding the marketing point of view, and namely to the group of vehicles with loading capacity up to 10 ton. This group features the significantly largest demand in the future period. Because of low stability of these data, two alternatives of the future demand were considered - a pessimistic one and an optimistic one. Values of the volume of transported goods and transport output have been selected to be variables.

The resulting demand for these trucks cannot be naturally expected to be satisfied exclusively by a future domestic producer, to the contrary, more active operations of other participants at the market, especially importers, can be expected.
Therefore, dimensioning of the capacity of the production plant in AKAKI has been determined, in compliance with the realistic technical possibilities, in variants ranging from 1500 pieces up

to 5000 pieces of annual production, which approximately makes 30% up to 50% of the total market demand.

In particular, the following variants were analyzed:

VARIANT 1 - annual production of 3000 trucks in a single-shift working mode.

VARIANT 1A - annual production of 5000 trucks in a two-shift working mode.

VARIANT 2 - annual production of 1500 trucks in a single-shift working mode.

VARIANT 2A - annual production of 3000 trucks in a two-shift working mode.

Having performed a technical design and determined the required expenditure on the realization and costs of the operation of the production system, we can state the following economic results of the individual variants:

	Variant			
	1	1A	2	2A
Total investment (thousand USD)	122,000	125,600	80,400	83,480
Net present Value (thousand USD)	55,123.2	111,555	4,531.7	83,110.5
Internal rate of return (%)	16.6	19.3	12.22	21.39
Pay back period (years)	6	6	9	5

The results indicate that:

- the Variant 1, where the capacity is 3000 vehicles annually in a single-shift operation, is better rather than the Variant 2 considering single-shift production of 1500 vehicles per year;

- the modifications of the variants considering a two-shift production mode are always generally better;

- the order by the criterium of NPV is:

1. Variant 1A	US$ 111,555	thousand
2. Variant 2A	US$ 83,110.5	thousand
3. Variant 1	US$ 55,123.2	thousand
4. Variant 2	US$ 4,531.7	thousand

- the order by the criterium of IRR is:

1. Variant 2A	21,39 %
2. Variant 1A	19,3 %
3. Variant 1	16.6, %
4. Variant 2	12,22 %

- the Variant 1A requires the highest capital expenditure (US$ 125.6 mil.), the Variant 1 the second highest (US$ 122 mil.), while the variant 2 requires US$ 80.4 mil. and the Variant 2A US$ 83.5 mil.
  The difference, however, consists in the different capacity of production.

- the two-shift operation mode, i.e. the Variants 1A or 2A, requires a minimum of further capital expenditure compared with the variants using the production machinery in a single-shift operation.

- the Variant 2A considers the full utilization of both working shifts, while the Variant 1A considers a realistic utilization of the production machinery (5000 vehicles in two shifts, 3000 vehicles in one shift). Thus the Variant 2A is economically better.

Based on the economic analysis, the Variant 1 can be recommended to be subject to a more detailed technical and economic analysis due to the disputable possibility of providing for a two-shift operation in the given region.
This variant always makes it possible to increase the utilization of the production machinery and growth of annual production up to 5000 trucks per year.

In conclusion, the following facts can be stated:

- the market demand for trucks depends on the development of the economic system in the region;
- the political stability determines the trend of development of the economic system in the region;
- the projected growth of the number of inhabitants will result in the necessity to increase the volume of transported goods and, subsequently, the number of trucks;
- an integral part of increasing of the number of vehicles is general increase of the level of infrastructure in the region;
- the high requirements on imports in the region and the small volume of exports result in a chronical lack of convertible currency;
- the potential consumers - users of trucks are mainly state-owned organizations;
- gradual formation of a market environment in the region can be expected;
- the price of trucks in Ethiopia ranges from US$ 75 thousand up to 120 thousand;

- the reconstruction of AKAKI Spare Parts and Hand Tools Factory, Ethiopia for production of trucks is both technically and economically feasible;
- the effect of the proposed production system on the environment is minimal;
- the reconstruction of the plant in AKAKI requires new jobs (about 600 - 1,200 workers according to the variant of the design);
- the ratio of own production of components in the AKAKI plant in the total set for the truck is about 50%.

The risks and uncertainties of the design can be formulated as follows:

- political stability in the region;
- providing for the financing of the project;
- volume of the future market demand;
- economic environment in Ethiopia;
- supplying of the AKAKI plant with materials;
- cooperation of subcontractors from the region during production.

Action oriented recommendations

On the basis of the above mentioned facts and analysis following future actions can be recommended :

1. To inform relevant Ethiopian authorities on the findings and results of this study and to discuss with them the issue of future conditions for foreign investmens as the existing rules and regulations do not provide effective guarantee for foreign capital inflow.

2. To make a decision on the chosen variant of solution.

3. To elaborate a detailed feasibility or engineering study for the chosen variant.

4. To contact potential investors who could be interested in the project s implementation, especially renowned world manufacturers of road transport equipment as well as specialized banking institutions.

20706 (4 of 4)

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

FINAL REPORT

Project No. DU/RAF/89/850

REGIONAL DEVELOPMENT OF AN EXISTING PLANT FOR MANUFACTURE OF TRANSPORT MEANS AKAKI, ETHIOPIA

PRE - FEASIBILITY STUDY VOLUME II.

ELABORATED BY UNIDO
FOR THE ECONOMIC COMMISSION
FOR AFRICA FOR AFRICAN GOVERNMENTS

POLYTECHNA, Co.
Prague, Czech Republic

PROJEKTA Ltd.
Prague, Czech Republic

November 1993

ANNEX NO. 1

Data obtained during survey in Ethiopia

Contents:

Data for economic assessment of the AKAKI study

1. Techno-economic indicators of AKAKI plant

- Original capital expenditure:
  - in national currency - equivalent US $ 30 869,000 (exchange rate 2.04 per $)
  - in foreign currency - equivalent US $ 52 512,000

- After write-off of losses for the first three years of operation, price reduced to ca. 92 million Birr, i.e. at the present rate of exchange (5.00 Birr per 1 US $) about $ 18.4 million

- Over the first three years of operation, the plant's losses exceeded 50 million Birr

- At present, the plant has an overdraft on the current account of 10 million Birr, at 13% annual interest, and obtained a short-term bank loan of 10 million Birr, at the same rate of interest. The administration buildings of the plant and the unfinished housing estate for employees are mortgaged; the possibility of another bank loan is highly doubtful

- The plant operates at present at 15-20% of capacity so that repayment of existing debts is highly doubtful
- Direct production costs are shown in breakdown by professional categories and analyzed in Table No. 1
- Overhead costs are shown in breakdown by technological sections in Table No. 2
- Non-production costs (energy, wages of non-productive employees, depreciation etc.) are tabulated in No. 3
- The organizational structure of the plant has been recently modified and a marketing department established; the present organization is shown in Table No. 4

2. Situation in freightage

- Registered vehicles in breakdown by number and type, for the last twenty years, are shown in Table No. 5

- Statistical figures on vehicles operated in the state sector (ACTUAL) and by private companies (ASSOCIATES), and freught in tons and ton/kilometers are shown in Table No. 6

- Trucks in breakdown by number and type, with purchase prices (CIF, without taxes and import duty), and years of purchases by Ethiopian Freight Transport Corporation,are shown in Table No.7

- The Addis Abeba plant which assembles Fiat (IVECO) trucks and buses is a joint-stock company with Italian majority interest. For this reason, it was not possible to obtain any official information but unofficial sources disclosed that the plant is projected for assembly of 7,000 vehicles a year; at present, because of a shortage of ..... only 200-500 vehicles are assembled annually. Selling prices (in Birr incl. taxes and duty) are in Table No. 8

3. General economic information

- At present, a Provisional Government is in power; it promulgated a program of privatization and free-market economy but no legislation on this has been passed,and probably will not be until an elected government takes office in 1994. Foreign investment regulations (Proclamation No. 15) are in supplement No. 9.

- Until the end of 1992, the national currency was artificially maintained at 2.04 Birr per one US $, the present official rate is 5.00 Birr per 1 US $, the black market rate is now about 7.7

Birr per dollar and is still rising. The official rate of inflation is not being published.

- Bank loans are granted against guarantees, at 13% interest for one year, at 13.5% interest for five years, at 14% for periods exceeding five years. Discount rate is neither calculated nor published.

- Depreciation rates:
  - buildings and sites 5%
  - machinery and equipment 8%
  - office equipment 10%
  - motor vehicles 20%

- Commonly calculated rate of profit is 20% for spare parts, 25% for finished products

- Tax rates:
  - profit tax 50%
  - sales tax (on turnover) 12%
  - old-age pension insurance (from paid-out wages) 6%

- Price of land in Akaki area is about 1 Birr per square meter

4. AKAKI plant - drawings
   - layout, scaled 1:500
   - electricity distribution system
   - water distribution system
   - technological layout

5. Vater sample analysis report

6. Proclamation No. 15/1992

PŘÍMÉ MZDOVÉ NÁKLADY

DIRECT LABOUR COST RATES

NO.	COST CENTRE	CODE	NO OF PRODUCTION WORKERS	SALARY MONTHLY	SALARY ADDITION	SALARY TOTAL monthly	ANNUAL LABOUR COST	DAILY EFFECTIVE WORKING HRS	ANNUAL WORKING DAYS	ANNUAL WORKING HOURS	AVERAGE RATE PER/hr
2.1	Foundry	5100	44	14,285	1,429	15.714	188568	6	250	66,000	2.90
2.2	Pattern making	5165	7	3,140	314	3,454	41448	6	250	10,500	4.00
2.3	Bar cutting	5215	4	585	59	644	7728	6	250	6,000	1.30
2.3	Sheet Metal Work	5220	6	3,000	300	3,300	39600	6	250	9,000	4.40
2.3	Light Turning	5225	29	15,060	1,506	16,566	198792	6	250	43,500	4.60
2.4	Light Milling	5235	14	6,575	658	7,233	86796	6	250	21,000	4.10
2.5	Gear Cutting	5245	6	3,135	314	3,449	41388	6	250	9,000	4.60
2.6	Grinding & Light Drilling	5260									
		5255 5260	7	3.165	317	3.482	41784	6	250	10,500	4.00
2.7	Heavy Turning 5230 " Milling 5240 " Drilling 5265 Piston machining 5270 Series Manufacturing 5275		4	2,565	267	2,932	35184	6	250	6,000	5.90
2.8	Tools & Cutlery	5310	29	10,860	1,086	11.946	143352	6	250	43,500	3.30
2.9	Chrome plating	5120	3	1,595	160	1,755	21060	6	250	4 500	4.70
2.10	Phosphating	5125									
2.11	Forging	5400	14	6,155	616	6.771	81252	6	250	21.000	3.90
2.12	Heat treatment	5500	9	3.390	339	3.729	44748	6	250	13.500	3.30
	TOTAL	176	176	73.670	7.385	80.975	977700	6	250	264.000	—

REŽIJNÍ NÁKLADY

MANUFACTURING OVER HEAD COST RATES

250 Working days per year

COST CENTRES			MANUFACTURING OVER HEAD COST	ADMINISTRATIVE OVER HEAD COST	TOTAL OVER HEAD COST	NUMBER OF MACHINE	DAILY MACHINE HOURS	YEARLY MACHINE HOURS	MANUFAC. O.H. COST PER/HOUR	ADMINISTR. O.H.COST PER/HOUR	TOTAL O.H.COST per/HOUR
O.N.	NAME	CODE									
1.1	Foundry	5100	3,916,853	1,918,793	5,835,646	-	-	2250ton/year	120/kg	0.90/kg	2.70kg
1.2	Pattern Making	5165	278,064	136,218	414,282	14	43	10750	25.90	12.70	33.60
2.1	Bar cutting	5215	126,564	62,001	188,565	11	49.5	12375	10.20	5.00	15.20
2.2	Sheet metal work	5220	542,959	265,985	808,944	20	79	19750	27.50	13.50	41.00
2.3	Light turning	5225	1,080,223	529,181	1,609,404	55	260	65000	16.60	8.10	24.70
2.4	Heavy turning	5230	261,987	128,343	390,330	5	30	7500	34.90	17.10	52.00
2.5	Light milling	5235	1,057,442	518,021	1,575,463	57	290	72500	14.60	7.10	21.70
2.6	Heavy milling	5240	249,964	122,453	372,417	5	30	7500	33.30	16.30	49.60
2.7	Gear cutting	5245	1,673,175	819,657	2,492,832	16	72	18000	93.00	45.50	138.50
2.8	Light Grinding	5250	773,938	379,138	1,153,076	19	81	20250	38.20	18.70	56.90
2.9	Heavy Grinding	5255									
2.10	Light Drilling	5260	276,942	135,473	412,015	20	100	25000	11.10	5.40	16.50
2.11	Heavy Drilling	5265	93,595	45,801	139,996	4	20	5000	17.70	8.70	26.40
2.12	Piston Machining	5270	146,814	71,921	218,735	3	15	3750	39.20	19.20	58.40
2.13	Spring manufacturing	5275	49,993	24,491	74.484	2	10	2500	20.00	9,80	29,80
3.1	Hand Tools	5315	3.578,964	1,753,267	5,332,231	93	404	~~101000~~ 99750	35.40	17.40	52.80
3.2	Chrome Plating	5320	137,799	67,505	205,304	4	18	4500 + 1250 max.	30,60	15.00	45.60
3.3	Electrolytic	5325	66,177	32,419	98.596	4	18	4500	14,70	7.20	21.90
4.1	Forging	5400	727.066	356, 176	1.083.242			1200ton/year	0,60/kg	0, 30/kg	0.90/kg
	Heat treatment	5500	777.830	378.105	1.149,935		89.25	22315	34.60	16,90	51.50

Nevýrobní náklady

Departmental Mch. Budget

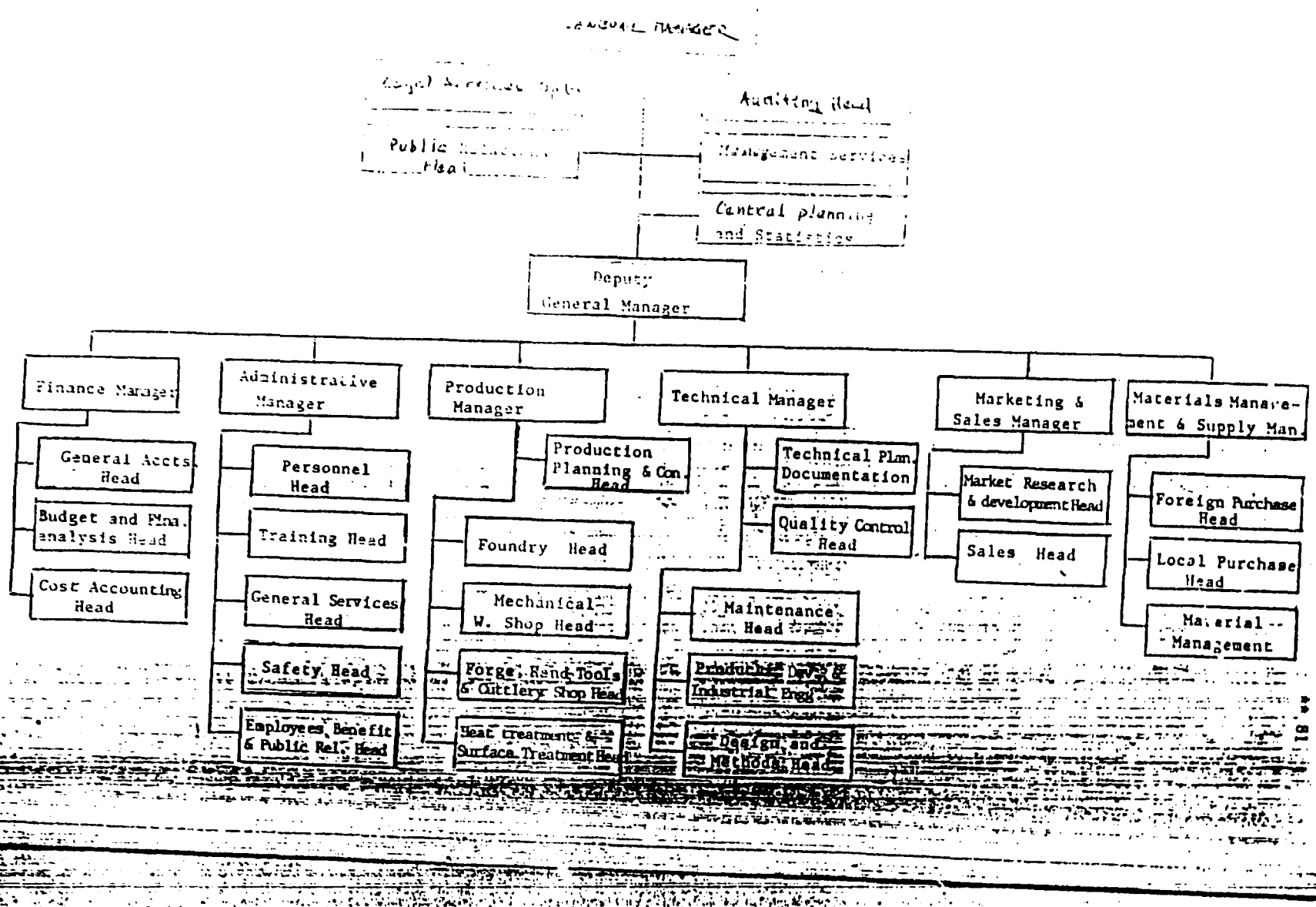
[illegible] č. 3

NO	COSTS	FOUNDRY	MACHINE SHOP SPARE PARTS	MACHINE SHOP TOOLS	CHROME PLATING	PHOSPH-ATING	FORGING	HEAT TREATMENT	PATTERN MAKING	TOTAL
1	Indirect materials	[illegible],790	415,372	282,375	8,977	2,706	12,406	22,411	11,221	959,258
2	Spare Parts	2[illegible],256	520,272	353,688	11,244	3,389	15,579	28,071	14,055	1,201,514
3	Salaries permanent employees	3[illegible]2,009	748,955	203,016	14,580	14,580	172,260	97,364	52,427	1,655,191
4	Wages Temporary Employees	[illegible],310	4,064	1,098	81	81	935	528	284	8,981
5	Overtime	6,[illegible]91	14,875	4,017	297	297	3,421	1,934	1,041	32,873
6	Leave pay	6[illegible]8	1,357	367	27	27	312	176	95	2,999
7	Compensation for service	1,[illegible]01	2,768	748	55	55	637	359	194	6,117
8	Pension contribution	20,602	43,833	11,834	877	877	10,083	5,698	3,068	96,872
9	Medical & Sanitry sup.	9,319	19,829	5,353	397	397	4,561	2,578	1,337	43,821
10	Uniforms & Protective div.	20,671	43,981	11,974	880	880	10,116	5,718	3,078	97,198
11	Education & Tuition fee	991	2,108	570	42	42	485	274	147	4,659
12	Depreciation - Building	327,509	548,411	102,827	17,138	17,138	88,817	91,284	81,876	1,274,996
13	Depreciation- Machinery	1,113,378	2269,329	1,542,722	49,043	14,783	67,776	122,441	61,306	5,240,778
14	Depreciation - Spec. Equip.	83,328	169,838	115.458	3,670	1,107	5,072	9,164	4,588	392,223
15	Depreciation- Power sup. inv.	246,412	502,246	341,[illegible]34	10,854	3,272	15,000	27,099	13,568	1,159,885
16	Depreciation - Forging Dies	124,449	255.649	172,[illegible]54	5,482	1,652	7,576	13,686	6,851	585,775
17	Maintenance	1[illegible],172	283.665	192,[illegible]0	6,130	1,848	8.472	15,306	7,663	655,097
18	Rent-Equipment	15,029	30,632	20,[illegible]5	662	200	915	1,652	828	70,741
19	Fuel oil & Lubricants	334,518	46,175	52,[illegible]	1,041	314	208,945	203,945	1,301	835,780
20	Stationery	2,179	4,637	1,252	93	93	1.067	502	325	10.248
21	Electricity & Water	561.017	201,618	62,970	2,002	603	78,690	102.767	5,667	1,015,334
22	Property Insurance	[illegible]	142,949	[illegible]	3,039	933	4,269	7.713	3,862	[illegible]0,126
23	Workmen Insurance	18,908	40.225	10.860	805	805	9.252	5.229	2,815	88.897
24	Miscellaneous Expenses	7.560	15,409	10,476	333	100	460	837	417	35.586
		3,916 153	6328,196				727.066	771,830	278.064	15.804,949

6

ORGANIZAČNÍ SCHÉMA ZÁVODU AKKAKI

Tabulka č. 4



በ1964 ዓ.ም. እስከ 198[illegible] ዓ.ም. [illegible]

	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]				[illegible]				[illegible]		[illegible]		[illegible]		[illegible]		ድምር		ጠቅላላ ድምር
													አነስተኛ		ከፍተኛ		አነስተኛ		ከፍተኛ												
	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	ነባር	አዲስ	
1964	24072	2086	1562	10	2936	499	62	87	328	88	146	57	1066	57	[illegible]	49	2018	147	3424	351	289	11	809	179	181	1	730	224	38217	3846	42063
1965	27364	1801	2009	18	3893	444	146	109	309	100	325	89	1193	68	734	64	2298	167	3522	364	425	14	987	152	281	18	872	148	44358	3556	47914
1966	28288	2289	1953	20	3972	582	175	120	366	138	298	124	1198	50	855	31	2453	211	3794	333	401	27	1389	325	293	18	865	218	46300	4486	50786
1967	30910	2104	1711	10	3825	791	191	92	631	78	408	62	886	75	848	27	2201	214	3970	381	410	12	1320	124	299	2	798	184	48408	4158	52564
1968	32877	1135	1968	36	4306	1164	324	139	497	117	549	124	945	29	1063	38	1815	142	4252	257	419	11	1337	149	461	12	380	166	51195	3519	54712
1969	28621	1107	1887	101	4821	847	211	64	577	59	283	32	1034	14	849	10	1876	150	2845	77	348	7	979	62	334	5	344	255	44989	2790	47779
1970	28697	713	1393	11	5058	865	163	76	334	29	501	45	765	21	371	18	2134	496	2231	96	327	7	705	18	242	7	219	81	43136	2485	45621
1971	26071	626	3076	15	5868	833	227	116	251	43	305	110	1959	72	617	20	3518	729	3591	793	265	9	1108	378	208	5	270	55	47534	3804	51330
1972	29049	511	2708	7	6976	1248	171	102	259	59	397	151	1525	63	1063	7	4215	197	4662	285	405	64	1269	210	356	21	280	56	53334	2961	56295
1973	27895	564	2806	37	7415	1253	201	157	282	103	292	182	2054	92	768	128	3700	163	4195	245	482	1	1565	73	436	3	375	275	52465	3316	55781
1974	28029	401	3183	119	7892	870	157	213	444	67	672	250	1758	24	998	21	3562	98	4325	187	573	17	1604	59	481		783	566	54461	2892	57353
1975	26510	769	3080	180	10323	1279	488	137	451	114	1009	367	3443	148	761	56	3340	140	4144	151	583	28	1558	69	510	7	988	303	57188	3748	60936
1976	26016	1037	3319	91	11575	1370	472	191	573	301	1007	201	2992	144	699	73	3267	61	4250	308	578	37	1889	74	530	10	1059	233	58206	4125	62331
1977	25883	1591	3376	59	12886	1328	363	199	739	590	1112	192	2883	64	836	155	2995	49	3600	148	539	82	1547	25	482	35	1195	355	58536	4872	63408
1978	30626	575	4164	19	12837	1030	182	114	506	557	730	187	1869	3	860	60	3125	33	3974	134	689	37	1841	37	533	60	1027	284	62885	3130	66015
1999	26067	691	3258	196	11374	1548	328	167	2367	676	1127	479	3780	207	452	105	2368	61	2745	486	635	75	1149	230	295	83	1197	319	57140	5321	62461
1980	24468	555	3423	107	12978	1777	446	176	2354	353	1023	128	3840	198	871	37	2887	77	3748	242	714	45	1616	59	430	28	1206	491	60004	4275	64277
1981	26347	616	2582	28	12813	1634	583	188	2495	347	1493	484	1692	58	475	102	2528	45	6224	374	857	164	1660	30	461	59	1065	643	58273	4772	63045
1982	26778	1286	1842	205	9335	1216	208	46	1491	271	587	223	1332	113	244	17	4079	550	2608	96	4614	148	2043	174	422	113	1004	436	52533	4898	57431
1983	25458	3878	1054	1957	4941	977	122	65	1885	282	624	111	853	132	555	11	2959	879	3082	251	448	7	1556	201	405	3	1004	511	50453	9265	59718
1984	25168	3034	3798	527	7270	540	204	53	2088	414	345	121	1234	358	627	37	3423	1178	3061	516	336	17	1364	144	295	7	438	466	46073	7281	53354

TABLE 2.6

ETHIOPIAN FREIGHT TRANSPORT ENTERPRISE

(1982-1984E.C.) 1990-1993 BUDGET YEARS PERFORMANCE

GOVERNMENT VEHICLES

DRY CARGO	1989/90 (1982 E.C)	1990/91 (1983 E.C.)	1991/92 (1984E.C.)
	ACTUAL		
Operational vehicles	693	814	622
Ton '000	621.3	481.5	386.8
Ton km in million	447.5	329.3	264.5
BULK PRODUCT CARGO			
Operational vehicles	172	141	139
Ton '000	145.2	87.2	67.9
Ton km in million	120.6	72.9	62.2
DRY CARGO	ASSOCIATES		
Operational vehicles	5271	5622	5916
Ton '000	3705.5	3081.9	3728.8
Ton km in million	1374.1	1187.4	1486.9
BULK PRODUCT CARGO			
Operational vehicles	985	828	765
Ton '000	908.3	802.9	858.6
Ton km in million	648.6	492.5	606.7

ETHIOPIAN FREIGHT TRANSPORT ENTERPRISE

VEHICLES, PURCHASE PRICE AND PURCHASE DATE

	MAKE AND MODEL	PURCHASE PRICE		
		PURCHASE RATE	PR/TRACTORS	PR./SEMI-TRAILERS
	FIAT 330-30	100-1984 B.Y.	55,320 USD	17,135 USD C&F
		100-1985 B.Y	55,320 USD	20,148 USD C&F
DRY	FIAT 330-36	50-1988 "	109,250,000 Lira	- FOB
CARGO	MACK	95-1992 "	56,780.18 USD	24,806.50 USD FOB
	DAF 3300	75-1990 "	136,858.10 DM	23,943 USD FOB
	VOLVO F-12	105-1986 "	52,054 USD C&F	26,860.20 USD FOB
	TOTAL	-		
	FIAT 330-30	30-1988 B.Y.	45,360 USD	FOB
BULK	FIAT 330-36	25-1989 "	123,220,000 Lira	FOB
CARGO	FIAT 682N3	1978 "	-	-
	MERCEDES 2624	1979 "	-	-
	TOTAL	-		

Tabulka č.8

Prodejní ceny IVECO montovaných v A.M.C.E.

180.304	Big lorry truck	Birr 547.926,-
	Construction truck	583.262,-
135.174	Mini-truck	335.168,-
	Mini construction truck	367.759,-
F 135.17	Bus	569.017,-
F 79.14	Bus	237.817,-
	Trailer 7,5 m	201.326,-

Dle získaných informací je projektovaná kapacita 7.000 ks ročně, skutečné montované množství však nepřesahuje 500 ks ročně. Přesto má A.M.C.E. velké problémy s odbytem.

Dováží se kompletní podvozek s motorem a převodovkou, elektrické systémy, zbytek se kompletuje v Addis.

IMPORT

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	2ND QTY	CODE	1ST QTY	VALUE IN 000s
			150	455
ITALY			240	3,333
USSR			50	200
JAPAN			1,096	2,075
TOTAL				
778.891 ELECTRICAL PARTS OF MACHINERY & APPARATUS N.E.S. FOR INDUSTRIAL USE				
F.R.G.			988	52,945
U.K.			154	93,740
TOTAL			1,143	146,685
778.899 ELECTRICAL PARTS OF MACHINERY NEE.				
			8	340
DJIBOUTI			60	9,924
IRELAND			920	9,013
ITALY			40	521
SWITZERLAND			160	4,035
JAPAN			5	950
U.A.E			30	935
SAUDI ARABIA			10	2,540
UNSPECIFIED			1,233	22,305
TOTAL				
731.010 PASSENGER MOTOR VIHICLES (CARS, STATIONWAGONS WHERE THE CC IS UNDER 1300				
DJIBOUTI	0	NO	7,965	67,510
KENYA	1	"	1,000	8,650
TOGO	1	"	695	4,770
BEL.LUX.	23	"	21,081	131,820
DENMARK	1	"	900	4,045
FRANCE	33	"	28,265	247,480
F.R.G.	45	"	46,794	311,745
ITALY	37	"	33,475	194,710
HOLLAND	47	"	40,361	240,025
SWEDEN	1	"	750	6,538
U.K.	11	"	10,335	86,280
USSR	5	"	5,287	20,765
UNITED STATES	1	"	1,050	5,745
INDIA	1	"	865	4,945
IRAN	4	"	3,200	25,395
JAPAN	832	"	770,838	5,819,158
P.D.R.K	1	"	870	4,945
KOREA REP.	1	"	760	12,000

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	2ND QTY	CODE	1ST QTY	VALUE IN BIRR.
U.A.E	22	NO	19,405	130,960
SAUDI ARABIA	57	"	60,255	410,265
UNSPECIFIED	9	"	8,285	34,210
TOTAL	1,142	"	1,062,536	7,832,861

781.020 PASSENGERS MOTOR VEHICLES, WHERE THE C.C BETWEEN 1301-1600

DJIBOUTI	16	"	12,382	117,090
KENYA	1	"	950	5,220
TOGO	1	"	800	5,060
BEL.LUX.	8	"	7,280	42,930
DENMARK	1	"	900	5,120
FRANCE	40	"	39,079	497,910
F.R.G.	52	"	52,117	388,212
ITALY	25	"	25,754	191,485
HOLLAND	47	"	47,022	309,756
POLAND	2	"	1,897	18,585
RUMANIA	2	"	2,000	14,700
U.K.	13	"	13,446	196,005
USSR	3	"	3,420	18,695
JAPAN	455	"	429,722	3,591,032
P.D.R.K	1	"	1,185	3,590
KOREA REP.	11	"	9,671	69,195
U.A.E	19	"	16,675	223,240
SAUDI ARABIA	26	"	34,100	218,150
UNSPECIFIED	11	"	11,450	43,120
TOTAL	734	"	710,410	5,959,095

781.030 DO BETWEEN 1601-1800 CC

DJIBOUTI	5	"	5,363	48,480
BEL.LUX.	1	"	800	6,970
FINLAND	1	"	750	36,910
FRANCE	28	"	26,391	255,575
F.R.G.	32	"	35,754	611,195
ITALY	3	"	2,800	22,115
HOLLAND	3	"	2,726	20,375
SWITZERLAND	3	"	3,180	48,730
U.K.	2	"	1,965	14,310
JAPAN	86	"	82,327	615,091
U.A.E	4	"	3,822	28,005
SAUDI ARABIA	20	"	19,850	130,720
UNSPECIFIED	1	"	800	6,170
TOTAL	189	"	192,528	1,844,646

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	2ND QTY	CODE	1ST QTY	VALUE IN BIRR.
781.040 DO BETWEEN 1801 - 2000c.c				
	10	NO	11,151	166,440
DJIBOUTI	2	"	2,265	13,375
BEL.LUX.	1	"	1,970	12,575
CZECHOSLOVAKI	60	"	68,743	666,295
FRANCE	145	"	173,666	1,730,150
F.R.G.	11	"	13,310	195,220
ITALY	7	"	7,650	63,760
HOLLAND	1	"	850	15,255
PORTUGAL	6	"	6,990	98,110
SWEDEN	1	"	1,000	6,125
TURKEY	2	"	3,200	48,715
U.K.	166	"	166,900	1,439,255
JAPAN	2	"	2,000	17,355
P.D.R.K	8	"	10,650	137,675
U.A.E	22	"	22,060	207,125
SAUDI ARABIA	3	"	3,770	18,770
UNSPECIFIED	447	"	496,175	4,825,200
TOTAL				
781.050 DO OVER 2000 c c				
	2	"	2,000	16,070
DJIBOUTI	1	"	800	13,605
BEL.LUX.	4	"	5,245	44,630
FRANCE	38	"	47,052	518,365
F.R.G.	3	"	3,275	28,470
ITALY	2	"	2,110	21,145
HOLLAND	12	"	16,349	146,806
SWEDEN	1	"	1,500	5,220
TURKEY	1	"	1,265	25,465
U.K.	1	"	1,400	6,795
BURMA	23	"	33,935	460,023
JAPAN	1	"	1,000	14,925
U.A.E	14	"	19,750	294,230
SAUDI ARABIA	1	"	1,000	8,000
SIAM	3	"	3,000	1,835
UNSPECIFIED	112	"	139,681	1,606,039
TOTAL				
781.090 LANDROVERS, JEEPS & SIMILAR VEHICLES				
	47	"	27,323	965,790
DJIBOUTI	12	"	18,700	148,655
KENYA				

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	2ND QTY	CODE	1ST QTY	VALUE IN BIRR
SOMALIA	2	-	2,500	19,075
BEL.LUX.	6	-	9,840	167,345
FINLAND	2	-	3,220	60,715
FRANCE	15	-	18,965	400,805
G.D.R.	1	-	1,050	7,470
F.R.G.	51	-	71,911	715,301
ICELAND	1	-	2,000	6,910
ITALY	9	-	15,356	170,965
HOLLAND	10	-	15,097	204,760
SPAIN	11	-	17,000	988,000
SWEDEN	14	-	92,263	1,738,479
SWITZERLAND	8	-	26,970	284,056
TURKEY	2	-	3,100	24,191
U.K.	37	-	61,050	651,380
USSR	2	-	3,550	11,550
CANADA	2	-	4,450	97,640
UNITED STATES	2	-	6,970	13,810
IRAQ	1	-	720	4,865
JAPAN	1,620	-	2,470,039	24,571,060
JORDAN	1	-	1,000	6,885
P.D.R.K	1	-	1,500	6,910
U.A.E	9	-	9,900	88,390
SAUDI ARABIA	122	-	184,790	1,132,592
P.D.R.Y	1	-	1,200	12,515
UNSPECIFIED	48	-	46,630	463,185
TOTAL	2,046	-	3,177,144	32,913,299

10 LORRIES TRUCKS PICK UPS
OR (CAPACITY NE. 1500 KG)

DJIBOUTI	13		23,370	416,931
KENYA	2		3,000	9,975
FRANCE	2		1,800	36,735
F.R.G.	9		22,436	271,993
ITALY	11		22,302	836,605
HOLLAND	1		4,500	42,890
JAPAN	409		645,284	6,257,020
P.D.R.K	1		1,500	15,345
KOREA REP.	2		4,150	14,520
U.A.E	4		15,500	107,715
SAUDI ARABIA	18		40,100	365,410
UNSPECIFIED	53		69,255	585,795
TOTAL	525		853,247	8,960,934

LORRIES & TURCKS
PICK-UP & DELIVERY VANS
(CAPACITY EX. 1500 KG)

V

-IMPORT

	2ND QTY	CODE	1ST QTY	VALUE IN BIRR.
	5	NO	13,330	242,640
DJIBOUTI	6	"	32,300	214,905
KENYA	7	"	46,440	382,245
SOMALIA	2	"	16,000	160,050
AUSTRIA	1	"	8,000	34,635
CZECHOSLOVAKI	1	"	4,000	34,140
G.D.R.	81	"	534,061	5,522,756
F.R.G.	2	"	4,000	64,760
HUNGARY	197	"	1,256,212	10,655,238
ITALY	12	"	105,252	1,955,995
HOLLAND	14	"	180,935	3,913,960
SWEDEN	1	"	11,100	644,456
U.K.	11	"	40,650	608,805
USSR	1	"	56,000	11,100
IRAQ	1	"	2,000	39,575
ISRAEL	191	"	396,979	3,712,806
JAPAN	1	"	6,200	34,705
U.A.E	27	"	49,900	1,316,915
UNSPECIFIED	561	"	2,969,259	31,549,636
TOTAL				

782.121 LORRIES & TRUCKS, PICK-UP & DELIVERY VANS ASSEMBLED IN ETHIOPIA

	1	"	1,000	31,730
DJIBOUTI	1	"	7,600	42,890
GAMBIA	2	"	12,000	71,055
KENYA	5	"	108,100	393,340
F.R.G.	63	"	524,324	5,411,631
ITALY	1	"	5,000	34,050
JAPAN	2	"	11,609	96,415
SAUDI ARABIA	3	"	3,000	113,360
UNSPECIFIED	78	"	673,133	6,199,471
TOTAL				

782.130 AMBULANCES IMPORTED COMPLETE

	1	"	2,040	60,430
KENYA	1	"	700	13,540
ITALY	1	"	1,060	5,835
HOLLAND	1	"	1,980	61,907
JAPAN	4	"	5,780	146,712
TOTAL				

782.140 DAMPER TRACK, ROAD MOTOR

	2	"	3,300	61,585
JAPAN				

-IMPORT

	2ND QTY	CODE	1ST QTY	VALUE IN MIR.
UNSPECIFIED	7	NO	7,000	339,900
TOTAL	9	-	10,300	451,435
782.190 OTHER PASSENGER OR LOAD CARRYING VEHICLES				
SOMALIA	1	-	1,000	37,720
BEL.LUX.	3	-	24,000	467,355
F.R.G.	25	-	165,635	1,739,570
ITALY	44	-	332,217	1,949,540
SWEDEN	2	-	12,500	46,420
CANADA	5	-	18,050	758,195
JAPAN	45	-	120,300	1,199,925
SAUDI ARABIA	4	-	19,500	101,345
UNSPECIFIED	4	-	10,575	95,075
TOTAL	133	-	709,277	6,317,554
782.210 FIRE ENGINES & FIRE ESCAPES				
AUSTRIA	1	-	330	69,620
USSR	1	-	5,117	36,725
TOTAL	2	-	5,447	106,345
782.221 STREET-SPRAYING LORRIES & SIMILAR VEHICLES FOR THE CONSTRUCTION OR MAINTAIENACE OF ROADS				
U.K.			4,340	199,870
TOTAL			4,340	199,870
782.229 DITTO, OTHER				
DJIBOUTI	3	-	2,910	12,245
NIGERIA	1	-	22,000	563,190
ITALY	10	-	66,048	685,280
USSR	2	-	4,000	161,605
JAPAN	1	-	9,000	39,940
TOTAL	17	-	105,958	1,462,260
782.230 MOBILE RADIOLOGICAL MEDICAL OR DENTAL				
JAPAN	11	-	42,020	210,650
TOTAL	11	-	42,020	210,650

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-IMPORT

	2ND QTY	CODE	1ST QTY	VALUE
782.290 OTHER SPECIAL PURPOSES ROAD MOTOR VEHICLES				
JAPAN	4	NO	8,600	138,[illegible]
TOTAL	4	"	8,600	138,[illegible]
783.110 MICROBUSES, MINIBUSES, MINICOACHES & SIMILAR VEHICLES HAVING A CARRYING CAPACITY N.E IS PASSENGERS				
DJIBOUTI	4	"	9,050	108,800
DENMARK	2	"	3,200	119,335
F.R.G.	13	"	19,350	99,340
ITALY	12	"	21,480	561,788
HOLLAND	5	"	6,650	33,030
U.K.	1	"	1,539	9,990
JAPAN	366	"	580,001	4,933,448
U.A.E	4	"	5,400	45,950
SAUDI ARABIA	3	"	6,000	26,955
UNSPECIFIED	3	"	2,400	35,100
TOTAL	413	"	655,070	6,023,745
783.190 OMNIBUSES, BUSES & COACHES HAVING A SEATING CAPACITY EXCEEDING IS PASSENGERS				
DJIBOUTI	3	"	9,000	78,580
KENYA	2	"	11,000	100,580
SOMALIA	1	"	8,100	15,590
BEL.LUX.	1	"	5,990	14,280
F.R.G.	2	"	8,700	37,020
ITALY	12	"	155,710	817,631
HOLLAND	1	"	2,000	2,940
U.K.	1	"	10,000	16,570
INDIA	1	"	3,000	25,295
JAPAN	58	"	117,570	1,300,109
U.A.E	1	"	1,500	10,310
SAUDI ARABIA	11	"	25,500	297,905
UNSPECIFIED	3	"	6,304	221,875
TOTAL	97	"	364,374	2,938,685
783.200 ROAD TRACTORS FOR SEMI TRAILERS				
ITALY	14	"	62,232	642,865
SAUDI ARABIA	1	"	20	205
UNSPECIFIED	2	"	6,000	27,740
TOTAL	17	"	68,252	670,810

-IMPORT

		2ND QTY	CODE	1ST QTY	VALUE IN DIRR
734.110	CHASSIS WITH ENGINES FITTED, FOR PASSENGER VEHICLES				
	JAPAN	1	NO	1,000	4,500
	TOTAL	1	-	1,000	4,500
784.210	BODIES (INCLUDING CABS) FOR MOTOR VEHICLES OTHER THAN MOTORCYCLES				
	F.R.G.			60	4,765
	SWEDEN			100	1,235
	SAUDI ARABIA			212	2,705
	TOTAL			372	8,305
784.991	PARTS & ACCESSORIES FOR ROAD TRACTORS & AGRICULTURE TRACTORS				
	DJIBOUTI			3	2,860
	ALBANIA			212	223,040
	AUSTRIA			190	26,760
	BEL.LUX.			60	19,855
	FINLAND			69	5,865
	F.R.G.			2,621	137,954
	ITALY			21,131	270,941
	HOLLAND			6,260	166,346
	SWEDEN			4,503	91,605
	U.K.			776	38,973
	YUGOSLAVIA			70	1,250
	UNITED STATES			2,679	192,075
	SAUDI ARABIA			70	11,505
	AUSTRALIA			900	92,425
	TOTAL			39,644	1,277,474
784.999	OTHER PARTS & ACCESSORIES FOR MOTOR VEHICLES OTHER THAN MOTORCYCLES				
	DAHOMEY			362	130,960
	DJIBOUTI			40,757	618,655
	KENYA			1,270	141,449
	NIGER			220	2,271
	NIGERIA			305	5,259
	AUSTRIA			1,579	45,736
	BEL.LUX.			153	6,697
	CZECHOSLOVAKIA			146	19,496
	DENMARK			25,382	1,642,207

ČKD DUKLA
VÝZKUMNÝ ÚSTAV ÚPRAVY VOD
186 06 Praha 8 - Karlín, Permerova 35
tel. 251 2251, fax 232 7094

Zkušební protokol

Pořad. číslo : 868/1993

Protokol obdrží: Projekta Praha 8
Objednavatel : Projekta Praha 8
Objednávka : 27.4.1993
Číslo rozboru : 53268

Věc : Rozbor vzorku vody pro průmyslové účely.

Společnost s r.o. Projekta Praha 8 nám předala dne 30.04.1993 k rozboru vzorek vody z Etiopie (Addis Abeba - závod Akaki).

Výsledky rozboru

V dodaném vzorku vody byly provedeny tyto analýzy :

Konduktivita při 25 °C	48.3	mS/m
Hodnota pH při 25 °C ..	7.46	
$KNK_{8,3}$ (p-hodnota)	0.00	mmol/l*)
$KNK_{4,5}$ (m-hodnota)	4.43	mmol/l*)
Tvrdost	3.38	mmol/l*)
Ca	31.3	mg/l
Na	26.4	mg/l
K	3.1	mg/l
Chloridy	8.9	mg/l
Dusičnany	14.2	mg/l
$CHSK_{Mn}$ O_2	1.3	mg/l
CO_2 veškerý	209.5	mg/l
CO_2 volný	14.9	mg/l

*) mmol chemických ekvivalentů

Analyzoval : KUBÍKOVÁ Jana

Praha dne : 06.05.1993

Ing. Vlastimil KŘÍŽ
ved. chem. laboratoře VÚÚV

ČKD DUKLA, koncernový podnik
Výzkumný ústav úpravy vod
AUTORIZOVANÁ LABORATOŘ

አምሳ አንደኛ ዓመት ቁጥር ፲፩
51st Year No. 11

አዲስ አበባ ግንቦት ፲፯ ቀን ፲፱፻፹፬ ዓ.ም.
Addis Ababa 25th May. 1992

የኢትዮጵያ የሽግግር መንግሥት

ነጋሪት ጋዜጣ
NEGARIT GAZETA

OF THE TRANSITIONAL GOVERNMENT OF ETHIOPIA

የአንዱ ዋጋ 0.60

በኢትዮጵያ የሽግግር መንግሥት
የተወካዮች ምክር ቤት ተጠባባቂነት የወጣ

የፖስታ ሣጥን ቁ. ፹ሺ፩ 80,001

ማውጫ

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PROCLAMATION No. 15/1992

A PROCLAMATION TO PROVIDE FOR THE ENCOURAGEMENT EXPANSION AND COORDINATION OF INVESTMENT

Whereas it is necessary to provide for the encouragement of investment with a view to speeding up the economic and social development endeavours of the Country, increasing the supply of goods and services and, thereby to advancing the benefits of the Country, and of the investor;

Whereas it has been found essential to encourage foreign investment to participate widely and constructively in the rehabilitation and reconstruction efforts of the Country and, in the process, to create suitable conditions whereby the interests of the Country and that of investors are protected;

Whereas it is necessary to develop, promote and encourage domestic private capital which is capable of widely investing its resources in all sectors and particularly in the productions sectors of the economy and contribute to the accelerated and balanced growth of the Country;

Whereas it has been deemed necessary to expand the domestic market by revising and harmonizing investment laws and regulations and by eliminating the bureaucratic hurdles to private investment as well as to broaden the foreign exchange earnings of the Country by promoting foreign trade;

በኢትዮጵያ የሽግግር ወቅት ቻርተር አንቀጽ ፱ (መ) መሠረት የሚከተለው ታውጇዋል ።

ክፍል አንድ

ኢንቨስትመንትን ስለማበረታታት ፣ ስለማስፋፋትና ስለ ማስተባበር

ምዕራፍ አንድ

ጠቅላላ ውሳኔዎች

፩. አጭር ርዕስ

ይህ አዋጅ «ኢንቨስትመንትን ለማበረታታት ለማስፋፋ ትና ለማስተባበር የወጣ አዋጅ ቁጥር ፲፭/፲፱፻፹፪ » ተብሎ ሊጠቀስ ይችላል ።

፪. ትርጓሜ

የቃሉ አገባብ ሌላ ትርጉም የሚያሰጠው ካልሆነ በስተ ቀር በዚህ አዋጅ ውስጥ ፡

፩. «የሚመለከተው አካል » ማለት በዚህ አዋጅ ውስጥ ስለተጠቃለሉት ጉዳዮች በቀጥታም ሆነ በተዘዋዋሪ መንገድ ኃላፊነቱ የሚመለከተው የማዕከላዊ መንግ ሥት ወይም የክልል መስተዳድር ወይም በሕግ ሥል ጣን የተሰጠው ሌላ አካል ነው ።

፪. «ኢንቨስትመንት» ወይም « የኢንቨስትመንት ካፒ ታል» ማለት ምርት ለማምረት ፣ ግልጋሎት ለመሰ ጠትና የሳይንስና ቴክኖሎጂ ብሔራዊ አቅም ለመ ገንባት የፈሰሰ ቋሚና መነሻ የሥራ ማስኪጃ ሀብት ነው ።

፫. «የኢንቨስትመንት ፈቃድ» ማለት ባለሀብቱ ኢን ቨስትመንቱን ወይም የኢንቨስትመንት ካፒታሉን በሥራ ላይ ለማዋል የሚያስፈልጉትን ሁኔታዎች ማሟላቱን የሚያረጋግጥ በጽሕፈት ቤቱ የተሰጠ ሠነድ ነው ።

፬. «የአገር ውስጥ ባለሀብት »ማለት የኢንቨስትመንት ካፒታል በሥራ ላይ ያሠማራ ኢትዮጵያዊ ወይም ነዋሪነቱ በኢትዮጵያ ውስጥ የሆነ የውጭ ዜጋ ሲሆን መንግሥትን ፣ መስተዳድርንና ማንኛውንም መንግሥታዊ ኢንተርፕራይዝ ይጨምራል ።

፭. «ኢንተርፕራይዝ» ማለት በነጠላም ሆነ በትንጅት ወይም በጋራ የኢንቨስትመንት ካፒታል በሥራ ላይ ያሰማራ ሕጋዊ ሰውነት ያለው ተቋም ነው ።

፮. « ማስፋፋት » ማለት የምርትንና የአገልግሎትን መጠንና ዓይነት ለማሳደግ ወይም ጥራትን ለማሻ ሻል የተመዘገበውን ካፒታል አምሳ በመቶ (50%)ለዚሁ ዓላማ ሥራ ላይ ማዋል ነው ።

፯. «የውጭ አገር ባለሀብት» ማለት የኢንቨስትመንት ካፒታል ወደ አገር ውስጥ በማስገባት በሥራ መሰክ ያዋለ የውጭ አገር ዜጋ ወይም ሕጋዊ ሰውነት ያለው የውጭ አገር ተቋም ሲሆን እንደውጭ አገር ኢንቨስተር ለመቆጠር ከመረጠ ውጭ አገር ነዋሪ የሆነ ኢትዮጵያዊንም ይጨምራል ።

፰. «የውጭ ካፒታል » ማለት ከውጭ አገር የተገኘ ኢንቨስትመንት ሲሆን ወደ ካፒታል የተለወጠ ትርፍንም ይጨምራል ።

Now, therefore, in accordance with Article 9(d) of the Transitional Period Charter, it is thereby Proclaimed as follows:

Part One

Encouragement, Expansion and Coordination of Investment

Chapter One

General Provisions

1. *Short Title*

This Proclamation may be cited as the "Encouragement, Expansion and Coordination of Investment Proclamation No. 15/1992."

2. *Definitions*

In this Proclamation, unless the context requires otherwise:

1. "appropriate authority" means the Central Government or a national/regional self-government or any other legally authorized body which is directly or indirectly responsible for any matters covered under this Proclamation;

2. "investment" or "investment capital" means fixed and initial operating resources used for the production of goods, the provision of services and the development of national science and technology capability;

3. "investment certificate" means a document issued to an investor by the Office evidencing his compliance with the conditions necessary for investing his capital;

4. "domestic investor" means an Ethiopian national or a foreign national permanently residing in Ethiopia who has made an investment and includes the State, the Government and state enterprises;

5. "enterprise" means a juridical person which has made an investment as sole proprietor, partner or joint owner;

6. "expansion" means investment amounting to at least 50% of the registered capital for the purpose of increasing the volume and quality of products and services or improving the quality thereof;

"foreign investor" means a physical or juridical person of foreign nationality which has invested imported investment capital and includes any Ethiopian national residing abroad who chooses to be treated as a foreign investor;

8. "foreign capital" means investment of foreign origin and includes profits converted into capital;

፱. «ባለሀብት» ማለት በዚህ አዋጅ አንቀጽ ፴፰ የተመለከተው አካል ነው ።

፲. «ባንድ» ማለት በዚህ አዋጅ አንቀጽ ፳፰ የተመለከተው አካል ነው ።

፲፩. «ባለሀብት» ማለት የአገር ውስጥና የውጭ አገር ባለሀብት ነው ።

፲፪. «መሬት» ማለት የኢንቨስትመንት ተግባር የሚካሄድበት ሊጣ መሬት ወይም በመሬት ላይ የተሠሩ ቋሚ ሥራዎችና ማሻሻያዎች የተደረጉበት መሬት ነው ።

፲፫. «ሰው» ማለት የተፈጥሮ ሰው ወይም ሕጋዊ ሰውነት ያለው ተቋም ነው ።

፲፬. «ብሔራዊ ክልላዊ መስተዳድር» ማለት ብሔራዊ ክልላዊ መስተዳድሮችን ለማቋቋም በወጣው አዋጅ ቁጥር ፯/፲፱፻፹፬ አንቀጽ ፫ መሠረት የተቋቋመ አካል ነው ።

፲፭. «ውኃ» ማለት ለእርሻ ፣ ለኢንዱስትሪ ፣ ለኃይል ማመንጫ ፣ ለመጠጥ ፣ ለመዝናኛና ለመሳሰሉት አገልግሎት የሚውል የወንዝ ፣ የኩሬ ፣ የኃይቅና የጉድጓድ ውኃ ነው ።

፫. የሽግግር መንግስቱ የኢኮኖሚ ፖሊሲ የኢንቨስትመንት ዓላማዎች ፣

የሽግግር መንግሥቱ የኤኮኖሚ ፖሊሲ የኢንቨስትመንት ዓላማዎች የተከተለበትንና የኤኮኖሚ መሠረታዊ ፍላጐቶች ለማርካት ትኩረት በመስጠት ቀጣይነት ባለውና የኢኮኖሚ ዕድገቱ በውስጣዊ ኃይል ላይ የተመሠረተ ሆኖ በዝርዝር ይዘታቸው የሚከተሉት ናቸው ።

፩. የአገሪቱን የምርትና የአገልግሎት አቅርቦት በዓይነት፣ በጥራትና በመጠን እንዲጨምር ፣ ሰፊና ፈጣን የሥራ እንቅስቃሴ የሚታይበት የአገር ውስጥ ገበያ እንዲኖር ማድረግ ፣

፪. ለኢትዮጵያውያን ሰፊ የሥራ ዕድል መፍጠር ፣

፫. በኢኮኖሚው በአጠቃላይ ፣ በተለይም ቀጥተኛ እምራት በሆኑ ከፍላተ ኢኮኖሚ ውስጥ በሰፊው የሚሳተፍ የአገር ውስጥ የግል ካፒታል እንዲፈጠር ፣ እንዲን ቀላቀስና እንዲጠናከር ማድረግ ፣

፬. አገሪቱ ወደ ውጭ የምትልካቸው ሸቀጦች በመጠን፣ በዓይነትና በጥራት እንዲያድጉ ማበረታታት ፣

፭. የውጭ ኢንቨስተሮች በአገራችን ኢኮኖሚ ግንባታ አጥጋቢ ሚና እንዲኖራቸው ማበረታታት ፣

፮. የአገር ውስጥ ጥሬ ዕቃዎች ፣ የማምረቻ መሣሪያዎችና ሌሎችም መገልገያዎች እንዲመረቱና በጥቅም ላይ እንዲውሉ ማበረታታት ፣

፯. መንግሥት ቅድሚያ ትኩረት በሚሰጣቸው አካባቢዎች ወይም ከፍላተ ኢኮኖሚ ኢንቨስት ለማያደርጉ ባለ ሀብቶች ተጨማሪ ማበረታቻና ድጋፍ በመስጠት የተመጣጠነና የተቀሃደ የልማት እንቅስቃሴ እንዲኖር ማድረግ ፣

፰. ለአገሪቱ የልማት እንቅስቃሴ ተስማሚ የሆነው የውጭ አገር ቴክኖሎጂ ፣ የአሠራር ጥበብና የቴክኒክ ሙያ ወደ አገሪቱ ዜጐች እንዲሰርጽ ማነቃቃት፣ ማመቻቸት ፣

፱. የሀገሪቱን የተፈጥሮ ሀብት በማንቀሳቀስና በመንከባከብ ግልግት ፣ ማዳበርና ጥቅም ላይ ማዋል ።

9. "Office" means the body specified in Article 11 of this Proclamation;

10. "Board" means the body specified in Article 28 of this Proclamation;

11. "investor" means domestic investor and foreign investor;

12. "land" means land, whether bare or with permanent works and improvements made on it, on which investment activity is undertaken;

13. "person" means a physical or juridical person;

14. "national regional self-government" means a national regional self-government established pursuant to Article 3 of the National/Regional Self-Governments Establishment Proclamation No. 7/1992;

15. "water" means water obtained from rivers, pools, lakes and wells which is used for agricultural, industrial, energy, drinking, entertainment and other similar purposes.

3. *Investment Objectives Of the Transitional Government Economic Policy*

The investment objectives of the Economic Policy of the Transitional Government shall, based on a sustainable economic growth and propelled by internal dynamics of its own, be geared to meeting the basic needs of the population and of the economy, and in their details, shall be the following:

1. to develop a domestic market of extensive and dynamic activity with a view to achieving an increase in the variety, quality and volume of the supply of the goods and services of the Country;

2. to create wide employment opportunities to Ethiopians;

3. to promote the development, activation and strengthening of domestic private capital which widely participates in the economy in general and in the production sector in particular;

4. to encourage the expansion in volume, variety and quality, of the export products of the Country;

5. to encourage foreign investors to play proper roles in the economic reconstruction endeavours of our Country;

6. to encourage the production and utilization of domestic raw materials, production machinery, equipment and other goods;

7. to grant additional incentives and support to investors in regions and sectors identified by the Government as priority areas with a view to achieving balanced and integrated development activities;

8. to encourage and facilitate the absorption by Ethiopian nationals of foreign technology, know how and technical skills appropriate to the development activities of the Country;

9. to activate, protect, develop, enrich and utilise the natural resources of the country.

ምዕራፍ ሁለት

ባለሀብቶች፡ የኢንቨስትመንት የሥራ መስኮችና ማበረታቻዎች

፬. በመንግሥት የሚካሄዱ የሥራ መስኮች

፩. ከዚህ በታች የተዘረዘሩት የሥራ መስኮች በመንግሥት ብቻ የሚካሄዱ ይሆናሉ ።

ሀ) የመከላከያ ኢንዱስትሪዎች፣

ለ) ከፍተኛ የኤሌክትሪክ ኃይል ማመንጨትና አገልግሎት አቅርቦት፣

ሐ) የፖስታና የቴሌኮሚኒኬሽን አገልግሎት፣

መ) ከፍተኛ የአየር መንገድ፣ የባቡርና የባሕር ትራንስፖርት አገልግሎት፣

ሠ) ኢንሹራንስ ባንክና ትላልቅ የገንዘብ ተቋሞች

ረ) ወደፊት በሚወጣው ሕግ በሚወሰነው መሠረት ከገቢና ውጭ ንግድ ውስጥ ባለገሪቱ ኢኮኖሚያዊ እንቅስቃሴ ላይ ወሳኝ ሚና ለሚጫወቱ ተብለው የሚመረጡ የተወሰኑ ምርቶች፣

፪. በዚህ አንቀጽ ንውስ አንቀጽ (፩) የተደነገገው እንደ ተጠበቀ ሆኖ፣ የአየር ፣የባቡርና የምተር ጀልባዎች ትራንስፖርት አገልግሎት እንዲሁም የኤሌክትሪክ ኃይል ማመንጨትና አገልግሎት አቅርቦት፣ በእነስ ተኖና በመካከለኛ የኢንቨስትመንት ደረጃ ላይ እስከተገኙ ድረስ በሚመለከተው አካል በሚወጣ ደንብ ወይም መመሪያ መሠረት ለኢትዮጵያውያን የግል ባለሀብቶች ይፈቀዳሉ ።

፫. በዚህ አንቀጽ ንውስ አንቀጽ (፩) የተደነገገው ቢኖርም፣ የባንኮችና የኢንሹራንስ ሥራዎች ለአገር ውስጥ የግል ባለሀብቶች የሚፈቀዱበት ሁኔታ በመንግሥት ተጠንቶ ይወሰናል ።

፭. መንግሥት በብቸኝነት ወይም ከግል ኢንቨስትመንት ጋር በቅንጅት ኢንቨስት የሚያደርግባቸው የሥራ መስኮች

መንግሥት በብቸኝነት ወይም ከግል ኢንቨስትመንት ጋር በቅንጅት የሚሳተፍባቸው የሥራ መስኮች የሚከተሉት ናቸው ።

ሀ) ታላላቅ የኢንጂነሪንግና የሜታለርጂ ኢንዱስትሪዎች፣

ለ) ከፍተኛ የኢንቨስትመንትና የቴክኖሎጂ አቅም የሚጠይቁ የማዕድንና የኢነርጂ ሥራዎች፣

ሐ) ታላላቅ የመድኃኒትና የማዳበሪያ ፋብሪካዎች፣

መ) ለኬሚካል ኢንዱስትሪዎች በስትራቴጂክ ጥሬ ዕቃነት የሚያገለግሉትን የሚያመርቱ ተቋሞች ።

፮. በግል ባለሀብቶች የሚካሄዱ የሥራ መስኮች

፩. በአንቀጽ ፬ እና በአንቀጽ ፭ ላይ የተገለጹት እንደ ተጠበቁ ሆነው፣ የግል ባለሀብቶች በተናጠል፣ በመተናጀት ወይም በጋራ የኢንቨስትመንት ሥራ ዎችን ለማካሄድ ይችላሉ ።

፪. በዚህ አንቀጽ ንውስ አንቀጽ (፩) የተደነገገው ቢኖርም፣ የካፒታል አቅምና ተፈላጊው ሙያ አስከላቸው ባለሀብቶች በአንቀጽ ፬ እና ፭ ላይ የተገለጸው ተጠብቆ ሆኖ፣ በኢንቨስትመንት የሥራ መስክ ለሚሠማሩ የአገር ውስጥ ባለሀብቶች ቅድሚያ ይሰጣል ።

Chapter Two

Investors' Investment Areas And Incentives

4. *Areas of Investment Reserved for Government*

1. The following areas are reserved for investment by the Government only:

a) defense industries;

b) large scale production and supply of electrical energy;

c) postal and telecommunications services;

d) large scale air, rail and marine transport services;

e) insurance, banking and large scale financial institutions; and

f) import-export trade in selected products having crucial roles in the economic life of the Country as determined by law.

2. Without prejudice to the provisions of sub-Article (1) of this Article, small or medium scale investment in air, rail and marine transport services as well as in the production and supply of electrical energy shall be open to Ethiopian private investors in accordance with regulations or directives issued by the appropriate authority.

3. The provisions of sub-Article (1) of this Article notwithstanding, the conditions under which investment in banking and insurance business may be open to private domestic investors shall be studied and decided by the Government.

5. *Areas Reserved for Investment by the Government on Its Own or in Partnership with Private Investors*

The areas exclusively reserved for investment by the Government or in partnership with private investors shall be the following:

a) large scale engineering and metalergical industries;

b) capital-intensive and technology-intensive investments in large scale mining and energy production;

c) large scale pharmaceutical and fertilizer plants; and

d) industries which supply strategic raw materials to chemical industries;

6. *Areas open for Private Investment*

1. Without prejudice to Articles 4 and 5 above, private investors can invest in any area of investment on their own, in partnership or in joint venture.

2. The provisions of sub-article 1 of this Article notwithstanding, domestic investors having the required investment capital and know-how shall be given priority consideration for investment, subject to Articles 4 and 5 of this Proclamation.

ሸ. የሀገር ውስጥና የውጭ ባለሀብቶች በሙቀናጀት የኢን ቨስትመንት ሥራዎችን የሚያካሂዱ ሲሆን አፈጻጸሙ ያገር ውስጥ ባለሀብቶችን መብትና ጥቅም በመጠ በት ቦርዱ በሚያወጣው መመሪያ መሠረት ይሆናል።

3. Where domestic and foreign investors undertake investment activities in partnership, it shall be in accordance with directives issued by the Board providing for the protection of the rights and interests of domestic investors.

፯. *ወደፊት መንግሥት በሚያወጣው ፖሊሲና ሕግ መሠረት የሚወሰኑ የሥራ መስኮች*

የማኅበራዊ አገልግሎቶች፣ የሬዲዮና የቴሌቪዥን ስርጭት አገልግሎት፣ ጋዜጦችንና መጽሔቶችን ጨምሮ የሚደረጉ ኢንቨስትመንቶች መንግሥት በሚያወጣው ፖሊሲና ሕግ መሠረት የሚፈጸሙ ይሆናሉ።

7. *Areas of Investment to be Determined by Future Government Policy and Law*

Investments in social services, radio and television broadcasting services including newspapers and journals shall be in accordance with the policy and law to be issued by the Government.

፰. *የኢንቨስትመንት ሠርቲፊኬት ለማግኘት መሟላት ስለ ሚገባቸው ሁኔታዎች*

8. *Conditions for the Issuance of Investment Certificate*

፩. ቦዚህ አዋጅ ውስጥ የተመለጉት ሌሎች ሁኔታዎች እንደተጠበቁ ሆነው፣ አንድ ባለሀብት የኢንቨስትመንት ሠርቲፊኬት ለማግኘት የሚችለው ቀጥሎ የተዘረዘሩትን ሲያሟላ ይሆናል፣

1 Without prejudice to the other provisions of this Proclamation, an investor shall be issued with an investment certificate only where he fulfills the following requirements:

ሀ) በዚህ አዋጅ አንቀጽ ፫ ከተመለከቱት የኢንቨስትመንት ዓላማዎች ቢያንስ አንዱን የሚያሟላ ከሆነ፣

a) fulfillment of at least one of the investment objectives stated under Article 3 of this Proclamation;

ለ) የውጭ ሀገር ባለሀብት ከሆነ በተናጠል ብሠሠር ውስጥ ባለሀብት ጋር በቅንጅት ወይም በጋራ ኢንቨስት ለማድረግ ቢያንስ አምስት መቶ ሺህ ፭፻ሺህ/ የአሜሪካን ዶላር የኢንቨስትመንት ካፒታል ከመደበና ቢያንስ የካፒታሉን በመቶ ሃያ አምስት (25%) በካሽ ገቢ ካደረገ፣

b) in the case of a foreign investor, investing on its own, in partnership or jointly with a domestic investor, an investment capital not less than United States Dollars Five Hundred Thousand (US$500.000) and depositing in cash not less than twenty five percent (25%) of the investment capital;

ሐ) ያገር ውስጥ ባለሀብት ከሆነ፣ ሁለት መቶ ሀምሳ ሺህ /፪፻፶ሺህ/ ብር ወይም ከዚያ በላይ የኢንቨስትመንት ካፒታል ከመደበ፣

c) in the case of a domestic investor, investing an investment capital not less than Two Hundred Fifty Thousand Birr (250.000);

፪. በዚህ አንቀጽ በንውስ አንቀጽ ፩/ሐ/ የተደነገገው ቢኖርም ማንኛውም ያገር ውስጥ ባለሀብት የኢንቨስትመንት ሠርቲፊኬት ሳይዝ ከተጠቀሰው የኢንቨስትመንት ካፒታል ከልል በታች ኢንቨስት ለማድረግ መብቱ የተጠበቀ ነው።

2. The provisions of sub-article 1(c) of this Article notwithstanding, a domestic investor may invest an investment capital below the minimum indicated without securing an investment certificate.

፫. በዚህ አንቀጽ በንውስ አንቀጽ ፩/ለ/ የተደነገገው ቢኖርም፣ የተለየ ትኩረት በሚሰጣቸው የሥራ መስኮች፣ ቴክኖሎጂ ወይም ዕውቀት ቦርዱ በሰጠው መመሪያ መሠረት የካፒታሉን መለል ዝቅ ለማድረግ ይችላል።

3. The provision of sub-article 1(b) of this Article notwithstanding, the initial investment capital in areas of special interest technology or knowhow may be lowered in accordance with directives issued by the Board.

፬. ማንኛውም የውጭ አገር ባለሀብት ወደ አገር ውስጥ ያስገባውን የኢንቨስትመንት ካፒታል በብሔራዊ ባንክ ማስመዝገብና ተገቢውን ማስረጃ መያዝ አለበት።

4. A foreign investor shall have the investment capital which he imported registered by the National Bank and obtain proper evidence to that effect.

፱. *ስለመሬት ማግኘትና አጠቃቀሙ*

9. *Allocation and Utilization of Land*

፩. ማናቸውም ባለሀብት ለኢንቨስትመንቱ የሚያስፈልገውን መሬት ያገኛል። መሬቱ የሚፈለግበት ተግባር፣ በአገልግሎት ላይ የሚቆይበት ዘመን፣ የክፍያ መጠንና ሌሎችንም ሁኔታዎች የመሬት ሕጋዊ ተጠቃሚ ወይም ባለመብት ከሆነው ወገን ጋር በሚያረግ ውል ይወሰናል።

1. Any investor shall be entitled to land required for his investment. The purpose for which the land is required, the period of use, the amount of rent and other relevant matters shall be determined in a lease agreement to be concluded between the investor and the party having legitimate interest or title in the land.

፪. የመሬት አጠቃቀም በሽግግር መንግሥት የኢኮኖሚ ፖሊሲ በቁጥር ፪-፪-፩-፪ ከተጠቀመውና ብሔራዊ ክልላዊ መስተዳድሮችን ለማቋቋም ከወጣው አዋጅ ቁጥር ፯/፲፱፻፹፬ ዓ.ም. ጋር በሚጻጻር ሁኔታ የሚመለከተው አካል በሚያወጣው ሕግ፣ ደንብና መመሪያ መሠረት ይሆናል ።

፲. ውሃ ስለማግኘትና ስለአጠቃቀሙ

፩. ማንኛውም ባለሀብት ለኢንቨስትመንት የሚያስፈልገውን ውሃ ከሚመለከተው አካል ጋር በሚያደርገው ውል መሠረት ሊያገኝ ይችላል ።

፪. የውሃ ሀብት አስተዳደር ብሔራዊ ክልላዊ መስተዳድሮችን ለማቋቋም በወጣው አዋጅ ቁጥር ፯/፲፱፻፹፬ አንቀጽ ፲ ንዑስ አንቀጽ ፮ መሠረት እንዲሁም የውሃ አጠቃቀም በተጠቀሰው ውልና የሚመለከተው አካል በሚያወጣው ሕግና መመሪያ መሠረት ይሆናል ፤ ሆኖም ከአንድ በላይ የሆኑ ብሔራዊ ክልላዊ መስተዳድሮችን አቋርጦ የሚፈስ ወይም የሚያዋስን ውሃ አጠቃቀምና የብክለት ደረጃ ማዕከላዊ መንግሥት በሚያወጣው ሕግና ደረጃ መሠረት ይሆናል ።

፲፩. ማበረታቻዎች የሚፈቀድባቸው የሥራ መስኮች

ቀጥሎ የተዘረዘሩት የሥራ መስኮች በዚህ አዋጅ አንቀጽ ፲፫ ላይ የተመለከቱት ማበረታቻዎች ይፈቀድባቸዋል ፤

፩. የግብርና ልማትና ግብርና ነክ ፋብሪካን በሚመለከት፣ የግብርና ምርት ፣ የግብርና ነክ ፋብሪካ ፣ የምርት ጥበቃ ወይም እንክብካቤ ፤ እንዲሁም ከእነዚሁ መስኮች ተጓዳኝ እንቅስቃሴ የሚገኙ ተረፈ ምርቶች ፤

፪. የኢንዱስትሪ ፋብሪካ ፤

ሀ) የኢንዱስትሪ ፋብሪካ ምርትና ተረፈ ምርት ፤

ለ) የፋብሪካ ዕቃ፣ መሣሪያ፣ የመለዋወጫ ዕቃ፣ የፋብሪካ ቁሳቁሶችና የመኪና አካሎች ማምረት ፤ ሌሎች ውጤቶችን መፈብረክና የመገጣጠሚያ ፋብሪካዎች መሥራት ፣ የኅትመት ሥራዎች፤

ሐ) በከፊል በፋብሪካ የተዘጋጁ ምርቶች ፤

፫. የኮንስትራክሽንና የሕንፃ ሥራ ኢንዱስትሪ ፤

ሀ) ከፍተኛ ኢንቨስትመንት የሚጠይቅ የመንገድ ሥራና የሕንፃ ኮንስትራክሽን ፤

ለ) እንደ ውሃ ጉድጓድ ቁፋሮ ፣ የውሃ ግድብ ሥራዎችና ሌሎች ተዛማጅ ተግባራትና የመሳሰሉ የውሃ ኮንስትራክሽን ሥራዎች ፤

፬. የተፈጥሮ ሀብትን በሚመለከት ፣ በአንቀጽ ፴፯ ላይ ማለትን በሚመለከት የተደነገገው ተጠብቆ የተፈጥሮ ሀብት ልማት ፣ ጥበቃና እንክብካቤ ፤

፭. የገጠር ትራንስፖርትን በሚመለከት ሰው ፣ ፈሳሽና ደረቅ ጭነት ዕቃና ምርት ወይም ተረፈ ምርት ለማጓጓዝ የገጠር ትራንስፖርት ተሽከርካሪዎች ግዥና አገልግሎት አቅርቦት ቦርዱ በሚያወጣው ዝርዝር መመሪያ መሠረት ተፈጻሚ ይሆናል ፤

2. The conditions of utilization of the land shall be governed by the lease agreement concluded conformably with the Economic Policy of the Transitional Government (item [illegible]) the National Regional Self-governments Proclamation No. 7/1992 and by the law, regulations and directives issued by the appropriate authority.

10. *Allocation and Utilization of Water*

1. Any investor may be allocated the water he requires for his investment on the basis of an agreement to be concluded with the appropriate authority.

2. The management of water resources shall be in accordance with Article 10(6) of the National/Regional Self-Governments Establishment Proclamation No. 7/1992; and the utilization of the water shall be in accordance with the lease agreement and the law and directive issued by the appropriate authority, provided, however, that, in the case of water that flows across or lies between more than one national/regional self-governments, the utilization and standard of pollution thereof shall be in accordance with the law and standard of pollution issued by the Central Government.

11. *Areas Qualified for Investment Incentives*

The following areas shall qualify for investment incentives specified under Article 13 of this Proclamation:

1. in the case of agricultural development and agro-processing; agricultural production, agro-processing, protection or preservation of products as well as by-products obtained from related activities;

2. in the case of manufacturing industry:

a) manufactured products and by-products;

b) manufacturing of equipment, machinery, spare parts, components and supplies, vehicle bodies, other products and assembling plants, publishing or printing works;

c) production of semi-manufactured supplies;

3. in the case of construction and building industry;

a) large scale capital-intensive road and building construction;

b) water works such as well drilling, dam construction and other related works and similar construction activities;

4. in the case of natural resources, without prejudice to Article 37 of this Proclamation, the development, protection and preservation of natural resources;

5. in the case of rural transportation, the purchase of transportation facilities and the provision of services for transporting people, liquid or dry freight, produce or by-product shall be in accordance with the directives issued by the Board;

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፯. [illegible] ቢሆኑ ማሽነሪዎችና አገልግሎቶችን በሚመለከት ይህ አንቀጽ ንዑስ አንቀጽ ፩ እስከ ፭ ለተዘረዘሩት የሥራ መስኮች እስፈላጊ የሆኑ ድጋፍ ሰጪ ማሽነሪ [illegible] ተለየ አገልግሎት የሚሰጡ እንደ መርጨ [illegible] የተገጠመላቸው ተሽከርካሪዎች መግዛት እንዲ [illegible] እንቬስትመንት ያላቸው አገልግሎቶች አቅርቦት ፣

፰. ይህ አንቀጽ ንዑስ አንቀጽ ፩ እስከ ፮ ከተመለከቱት የሥራ መስኮች ሌላ ብዝሃነት ጠቀሜታቸውና እንዲ [illegible] ከሌሎች ከፍለተ ኢኮኖሚ ጋር ያላቸው ከፍተኛ ትስስር እየታየ በቦርዱ የሚወጡትን መመዘኛዎች ሊያሟሉ የሚችሉ ተጨማሪ የሥራ መስኮች ።

፲፪. ለኢንቬስትመንት ማበረታቻዎች ብቁ መሆን

፩. የሚከተሉትን ሁኔታዎች ያሟላ ባለሀብት በዚህ አዋጅ አንቀጽ ፲፫ የተመለከቱትን ማበረታቻዎች ያገኛል ፤

ሀ) በዚህ አዋጅ አንቀጽ ፫ ላይ የተመለከቱትን መሠረት በማድረግ አንቀጽ ፰ ላይ የተጠቀሱትን ሁኔታዎች ያሟላና አንቀጽ ፲፩ ላይ በተዘረዘሩት የሥራ መስኮች የተሠማራ ፤

ለ) የውጭ ሀገር ባለሀብት ከሆነ በተናጠል ወይም ከአገር ውስጥ ባለሀብት ጋር ለመቀናጀት ወይም በጋራ ኢንቬስት ለማድረግ ከአምስት መቶ ሺህ (፭፻ሺህ) የአሜሪካን ዶላር ወይም ተመጣጣኝ የውጭ ምንዛሪ ያላነሰ ፤ የአገር ውስጥ ባለሀብት ከሆነ ከሁለት መቶ ሃምሳ ሺህ/፪፻፶ሺህ/ ብር ያላነሰ ካፒታል በሥራ ላይ ያዋለ ፤

ሐ) ሥራውን በጀመረ በሰላሳ ቀናት/፴/ ውስጥ ኢንቬስት ያደረገውን ትክክለኛ የካፒታል መጠን ማስረጃ ለጽህፈት ቤቱ ያቀረበ ፤ እና

መ) በዚህ አዋጅ አንቀጽ ፪ ንዑስ አንቀጽ ፮ በተመለከተው መሠረት መስፋፋት ተደርጎ ከሆነ መስፋፋቱን የሚያመለክት የተለየ የሒሳብ መዝገብ በመያዝ ያረጋገጠ ።

፪. በዚህ አንቀጽ ንዑስ አንቀጽ /፩/ የተደነገገው ቢኖርም የተለየ ትኩረት በሚሰጣቸው የሥራ መስኮች ፤ ቴክኖሎጂ ወይም የቴክኖሎጂ ዕውቀት በሚደረጉ ኢንቬስትመንቶች ቦርዱ በሚሰጠው መመሪያ መሠረት የካፒታሉ መለኪያ ቢቀንስም ኢንቬስተሩ በዚህ አዋጅ የተመለከቱት ማበረታቻዎች ተጠቃሚ ይሆናል ።

፲፫. ከቀረጥና ታክስ ክፍያ ነጻ ስለመሆንና ስለሌሎች ማበረታቻዎች

በዚህ አዋጅ ውስጥ በሌሎች አንቀጾች የተደነገጉት ተጠብቀው ፤ ያገር ውስጥና የውጭ አገር ባለሀብት ፤ የተቋቋመ ኢንተርፕራይዝና መስፋፋት ፤

፩. ለኢንቬስትመንት የሚፈለጉት የካፒታል ዕቃዎችና መሣሪያዎች ፤ እንዲሁም ኢንቬስት ከተደረገው ካፒታል እስከ አሥራ አምስት በመቶ /15%/ የሚደርስ የመለዋወጫ ዕቃ ግምር በአገር ውስጥ ባተቀራረቢ መጠን ፤ ጥራትና ዋጋ የሚገኙ ካልሆኑ በገቢ ዕቃዎች ላይ ከሚጣል ማንኛውም ቀረጥና ታክስ ነፃ ይሆናል ።

7. In the case of support machinery and services, the purchase of machinery such as spraying machinery and trucks fitted with refrigeration facility or other equipment for support services as well as the provision of services to the investment areas referred to under sub-Articles 1 to 5 of this Article.

8. Additional areas of investment, other than those enumerated under sub-Articles 1 to 6 of Article 11, having critical linkages with other sectors of the economy and which meet the criteria set by the Board.

12. *Conditions Qualifying for Incentives*

1. An investor who satisfies the following conditions shall qualify for the incentives specified under Article 13 of this Proclamation:

   a) on the basis of Article 3 of this Proclamation, he meets the conditions referred to in Article 8 and invests in one of the investment areas specified under Article 11;

   b) in the case of a foreign investor, he invests as a sole proprietor, or in partnership or jointly with a domestic investor, at least Five Hundred Thousand United States Dollars (US$500,000) or an equivalent amount in another convertible currency; and, in the case of a domestic investor, he invests at least Two Hundred and Fifty Thousand Ethiopian Birr (Birr 250,000);

   c) he produces, within thirty (30) days of commencement of operations, evidence showing the exact amount of the capital he invests;

   d) in the case of expansion as defined in subarticle 6 of Article 2 of this Proclamation he proves that the amount invested in the expansion is kept in a separate book of account.

2. Sub-article 1 of this Article notwithstanding, an investor who invests in areas of priority, or in technology or technological know-how in respect of which the initial capital has been lowered in accordance with the directives of the Board shall be entitled to the incentives provided for in this Proclamation.

13. *Tax Exemptions and Other Incentives*

Without prejudice to the other provisions of this Proclamation, domestic investors and foreign investors as well as existing enterprises and expansions shall be intitled to the following:

1. capital goods and equipment as well as spareparts upto fifteen percent (15%) of the value of the capital invested imported for investment purposes shall be exempt from the payment of duties and taxes levied on imports, provided, however, that they are not available in the country in comparable quantity, quality and price;

፬. የምርት ውጤት ካገኘበት ወይም የማምረት ሥራ ከጀመረበት ቀን አንስቶ ለሰባት ፫ ዓመት ከገቢ ግብር ነፃ ይሆናል ።

፫. መስፋፋት ያደረገ ባለሀብት ላደረገው መስፋፋት የምርት ውጤት ካገኘበት ወይም የማምረት ሥራ ከጀመረበት ቀን አንስቶ ለሁለት ፪/ ዓመት ከገቢ ግብር ነፃ ይሆናል ።

፬. የዚህ አንቀጽ ንውስ አንቀጽ ፩ ፣ ፪ እና ፫ እንደተጠበቁ ሆኖ ፣ በተለይ በተመረጠ አካባቢ፣ የሥራ መስክ፣ ትኩረት በተሰጠው ሙያ ወይም ቴክኖሎጂና መስፋፋት ለሚደረግ ኢንቨስትመንት ፣ በተጨማሪ ከሶስት ፫ እስከ አምስት ፭ ዓመት ከገቢ ግብር ነፃ ሊፈቀድ ይቻላል ።

፭. ወደ ውጭ አገር ለመላክ በኢትዮጵያ ውስጥ የተመረቱ ምርቶች እንዲሁም ከኢትዮጵያ ለውጭ አገር የሚቀርቡ ማናቸውም አገልግሎቶች በቦርዱ ውሳኔ እንደ አስፈላጊነቱ በወጪ ፅታዎችና አገልግሎቶች ላይ ከሚጣል የጉምሩክ ቀረጥና ከሌላ ከማናቸውም ታክስ ነጻ ይሆናሉ ።

፮. በዚህ አዋጅ አንቀጽ ፳፮ ንውስ አንቀጽ ፩ መ እና ሠ ላይ የተመለከቱትን ያለምንም ታክስ ከፍያ ወደ ውጭ አገር ለመላክ ይፈቀድላቸዋል ።

፯. ማንኛውም ባለሀብት ያጋጠመውን ኢንተርፕራይዝ ወይም መስፋፋት በመደገፍ ለሚያካሂደው የማሻሻያ ጥናት ፣ ምርምር ወይም የሥልጠና ፕሮግራም ያደረገው ወጪ ለታክስ ጉዳይ ተቀናሽ ይደረግለታል ።

፰. ከገቢ ግብር ነፃ መብት በተሰጠበት ዘመን ውስጥ ኪሣራ ያጋጠመው ማንኛውም ባለሀብት ፣ ኢንተርፕራይዝ ወይም መስፋፋት ይህንኑ የደረሰበትን ኪሣራ የነጻ መብቱ የተሰጠበት ጊዜ እንዳለቀ ለአንድ ዓመት ሊሸጋገርለት ይችላል ።

፱. ሀ) ማንኛውም ባለሀብት ለሥራው እንቅስቃሴ አስፈላጊ የሆኑና ተገቢው ሙያ ያላቸው የውጭ አገር ከፍተኛ ኤክስፐርቶችና ማኔጀሮች ሊቀጥር ይችላል ፣ ነገር ግን በዚህ መብት ከመጠቀሙ በፊት ተገቢውን ማስታወቂያ በማውጣት ተመሳሳይ ችሎታ ያላቸው ኢትዮጵያውያን የሌሉ መሆኑን ካረጋገጠ በኋላ ነው ።

ለ) በዚህ ንውስ አንቀጽ (ሀ) የተመለከተው እንደተጠበቀ ሆኖ ፣ የተጠቀሰው ባለሀብት አስፈላጊውን ሥልጠና እንዲሰጥ በማድረግ ኢትዮጵያውያኖችን በውስን ጊዜ ውስጥ የመተካት ኃላፊነት አለበት ።

፲. በዚህ አዋጅ መሠረት ከማንኛውም ቀረጥና ታክስ ነፃ የገባ የካፒታል ዕቃና መገሪያ የቀረጥ ነፃ መብት ላለው ሰው ሊተላለፍ ይችላል ።

፲፩. ማንኛውም ለኤክስፖርት (ለውጭ ገበያ) የሚውሉ ምርቶችን የሚያመርት ባለሀብት ፣ ኢንተርፕራይዝ ወይም መስፋፋት ከውጭ ለሚያስገባው ጥሬ ዕቃ በገቢ እቃዎች ላይ ከሚጣል ከማናቸውም ቀረጥና ታክስ ነፃ ይሆናል ።

2. exemption from the payment of income tax for a period of three (3) years from the date of commencement of production or operation;

3. in the case of expansion, exemption from the payment of income tax for a period of two (2) years from the date of commencement of production or operation of such expansion;

4. Without prejudice to sub-articles 1, 2 and 3 of this Article, additional exemptions from the payment of income tax may be granted for a period of three (3) to five (5) years in respect of investments in specifically designated localities and investment areas, priority technical know-how, technology and expansion.

5. Ethiopian products destined for export and services supplied to foreign countries from Ethiopia shall be exempt from the payment of duties and other taxes levied on export upon decision by the Board as may be necessary.

6. Any remittances referred to in Article 26 1(d) and (e) of this Proclamation shall be exempt from the payment of any tax;

7. Any expense incurred by an investor on research, improvement studies or training relating to his existing enterprise or expansion shall be deductible for income tax purpose.

8. A loss incurred by an investor, enterprise or expansion within the exemption period as stipulated above may be carried forward for one year following the expiry of such exemption period.

9. a) Any investor may employ duly qualified, senior, expatriate experts and managers required to operate his business, provided, however, that, before he exercises this right, he shall ascertain, by issuing the proper announcement, that Ethiopians having comparable qualifications are not available.

b) Without prejudice to the foregoing, the investor shall be responsible for arranging the necessary training and replacing, within a limited period, such expatriate personnel with Ethiopians.

10. Capital goods and equipment imported without the payment of duties and taxes levied on imports may be transferred to an other investor having similar privilege under this Proclamation.

11. Exemptions from the payment of import duties or taxes levied on imports shall be granted for imported raw materials necessary for the production of goods by an investor, enterprise or expansion for the export market.

፲፪. በትርፍ መልክ ያገኘውን ገንዘብ መልሶ በኢትዮጵያ ውስጥ በሥራ ላይ ያዋለ የውጭ አገር ባለሀብት አዲስ ሥራ ከአቋቋመ እስከ ሶስት (፫) ዓመት፡ መስፋፋት ከአደረገ እስከ ሁለት (፪) ዓመት ምርት መስጠት ወይም ሥራ ከጀመረበት ቀን እንሰቶ ከገቢ ግብር ነፃ መብት ይፈቀድለታል ።

፲፫. ስለኢንቨስትመንት ዋስትናና ጥበቃ

ማናቸውም ያገር ውስጥ ወይም የውጭ አገር ባለሀብት፡ ኢንተርፕራይዝ ፡ወይም ማስፋፋት ፡በመንግሥት በሚወጣ አጠቃላይ ፖሊሲና ሕግ መሠረት በቂ ካሣ በሚከፈል በት አኳኋን ካልሆነ በስተቀር በሙሉም ሆነ በከፊል አይ ወረስም ። ያለፍርድ ቤት ውሳኔ ንብረቱን ለመያዝ ፡ለግ ገድ ፡ለግስከበር ወይም ከይዞታው ውጭ ለማድረግ አይ ቻልም ።

ምዕራፍ ሶስት

የኢንቨስትመንት ማመልከቻዎች አፈታተድ፡የኢንተርፕራ ይዞች አመሠራረትና አመዘጋገብ

፲፭. የማመልከቻ አቀራረብና አፈታተድ

፩. በአንቀጽ ፮ ንውስ አንቀጽ ፩ (ለ) እና (ሐ) እንዲሁም በአንቀጽ ፲፪ ንውስ አንቀጽ ፩ (ለ) በተመለከቱት የካፒታል ክልል መሠረት ኢንቨስት ለማድረግ የሚ ጠይቅ ማንኛውም ባለሀብት ለዚሁ የተዘጋጀውን የማመልከቻ ቅጽ በመሙላት ከዚህ የሚከተሉትን እንዲፈጽዱለት ለጽሕፈት ቤቱ ያቀርባል ፡

ሀ) አዲስ ኢንተርፕራይዝ ለማቋቋም ወይም ማስ ፋፋት ለማድረግ ፡

ለ) የውጭ ሀገር ባለሀብት በነባር ኢንተርፕ ራይዝ ወይም መስፋፋት ውስጥ በሙሉ ወይም በከፊል አክሲዮን ለመግዛት ወይም ለመያዝ፡

ሐ) ከኢንተርፕራይዝ ፡መስፋፋትና ወይም ከነዚሁ ጋር የተዛመደ የቴክኖሎጂ ሽግግር ስምምነት ለመዋዋል ፡.

፪. በዚህ አንቀጽ ንውስ አንቀጽ ፩ ከተጠቀሰው ማመል ከቻ ጋር የሚከተሉት መቅረብ አለባቸው ፡

ሀ) አዲስ ኢንተርፕራይዝ የማቋቋሚያ ጽሑፍ ፡

ለ) ማስፋፋት ከሆነ አጭር መግለጫና የአፈጻጸም ፕሮግራም ፡

ሐ) ከቀረጥ ነጻ ለማስገባት የሚፈልጉትን የካፒ ታል ዕቃዎችና መሣሪያዎች ዝርዝር መጠንና የጋ ጭምር ፡

መ) የባለሀብቱ ወይም የባለአክሲዮኑ ዜግነት ፡

ሠ) የካፒታል መጠን ፡

ረ) ከኢንተርፕራይዙ ወይም ከመስፋፋቱ ጋር ዝምድና ባላቸው የቴክኒክ ፡ የሥራ አመራርና ሌሎች ሙያዎች ለኢትዮጵያውያን ስለሚሰጡ ሥልጠናዎች ፡

ሰ) የዚህን አዋጅ ዓላማዎች መሠረት በማድረግ ስለሚጠቀሱ ሌሎች ጉዳዮች ፡

፫. በቀረበለት የኢንቨስትመንት ጥያቄ ላይ ውሳኔ ከመ ስጠቱ በፊት ጽህፈት ቤቱ በጉዳዩ ላይ የባለሙያ አስተያየት በአሥራ አምስት (፲፭) ቀናት ውስጥ እንዲሰጠው ከሚመለከተው አካል ይጠይቃል ።

12. A foreign investor who reinvests his profits shall be exempt from the payment of income tax for upto three (3) years in the case of new investment and for two (2) years in the case of expansion from the date of commencement of production or operations.

14. *Investment Guarantees and Protection*

No assets of a domestic investor or a foreign investor, enterprise or expansion may be nationalized wholly or partly except in accordance with the general policy and law issued by the State and upon payment of adequate compensation. Such assets may not be seized, impounded, sequestrated or dispossessed except in accordance with a court order.

CHAPTER THREE

PROCEDURES FOR APPROVAL OF INVESTMENT APPLICATIONS, ESTABLISHMENT AND REGISTRATION OF ENTERPRISES

15 *Submission and Approval of Investment Application*

1 Any investor who intends to invest the minimum capital prescribed in sub-articles 1(b) and (c) of Article 8 and sub-article 1(b) of Article 12 shall fill out the form prepared for the purpose and submit same to the Office for approval in respect of any one of the following forms of investment:

a) estblishment of a new enterprise or expansion of an existing one;

b) buying or holding all or part of the shares of an existing enterprise or expansion by a foreign investor;

c) conclusion of a technology transfer agreement in respect of or related with his enterprise or expansion.

2. The following shall be submitted together with the application form referred to in sub-Article (1) of this Article:

a) the memorandum of association of the new enterprise;

b) in the case of an expansion, a brief statement and an implementation programme;

c) the list of capital goods and equipment to be imported duty free including quantity and price;

d) nationality of the investor or shareholder;

e) size of the investment capital;

f) type of training to be given to Ethiopian nationals in technical, managerial and other skills relating to the enterprise or expansion;

g) other matters related to the investment objectives of this Proclamation.

3. The Office shall, prior to making a decision on the application, request the appropriate authority for an expert opinion in writing to be given within fifteen (15) days.

፭. የቀረበለትን መረጃ በዚህ አዋጅ እንቀጽ ፫ ላይ ከተመለከቱት ዓላማዎች አንጻር ተገቢውን ግምገማ ካካሄደ በኋላ ጽህፈት ቤቱ አስፈላጊውን ውሳኔ ያደርጋል ። የኢንቨስትመንት ጥያቄውን ጽህፈት ቤቱ ያጸደቀው ከሆነ ማመልከቻውን በተቀበለ በሰድሳ (፷) ቀናት ውስጥ የኢንቨስትመንት ፈቃድ ይሰጣል ።

5. After due appraisal of all the information received in the light of the investment objectives stated under Article 3 of this Proclamation, the Office shall make a decision. If the Office approves the application, it shall issue an investment certificate within sixty (60) days of receipt of the application.

፲፮. ሕጋዊ አመሠራረት

ማንኛውም ኢንተርፕራይዝ በኢትዮጵያ የንግድ ሕግ መሠረት መቋቋም አለበት ።

16. *Legal Establishment*

An enterprise shall be established in accordance with the Commercial Code of Ethiopia.

፲፯. ምዝገባ

፩. ማንኛውም ኢንተርፕራይዝ ሥራ ከመጀመሩ አስቀድሞ የኢትዮጵያ ንግድ ሕግ በሚደነግገው መሠረት መመዝገብ አለበት ።

፪. የሚመለከተው አካል የምዝገባ ማመልከቻው ከኢንቨስትመንት ፈቃድና ከመመሥረቻው ጽሑፍ ጋር ሲያርሰው ለምዝገባ ብቁ የሚያደርጉ ፎርማሊቲዎችን አጠናቅቆ ከቀረበ በኋላ በአሥር (፲) ቀናት ውስጥ የምዝገባ ሰርቲፊኬት መስጠት አለበት ።

17. *Registration*

1. An enterprise shall be registered in accordance with the Commercial Code of Ethiopia prior to the commencement of operations.

2. Upon receipt of an application for registration together with a certificate of investment and the memorandum of association, the appropriate authority shall issue the investor with a certificate of registration within ten (10) days from the date of completion by the investor of the formalities required for registration.

፲፰. ፈቃድ ስለማውጣት

፩. ማንኛውም ኢንተርፕራይዝ ሥራ ከመጀመሩ አስቀድሞ አግባብ ባለው ሕግ መሠረት በሚመለከተው አካል የተሰጠ የሥራ ወይም ሌላ ፈቃድ ማግኘት አለበት ።

፪. የሚመለከተው አካል የፈቃድ ማመልከቻ ሲያርሰው ለፈቃድ ብቁ የሚያደርጉ ፎርማሊቲዎችን አመልካቹ አጠናቅቆ ካቀረበ በኋላ በአሥራ አምስት (፲፭) ቀናት ውስጥ የተጠየቀውን ፈቃድ መስጠት አለበት ።

18. *Licence Required*

1. Any enterprise shall obtain from the appropriate authority an operating licence or authorization pursuant to the relevant law prior to commencement of operation.

2. Upon receipt of an application for licence, the appropriate authority shall issue the investor with the required licence within fifteen (15) days from date of completion by the investor of the formalities required for licence.

፲፱. የእድገት ሪፖርቶች ስለማቅረብ

፩. የኢንቨስትመንት ፈቃድ የተቀበለ ባለሀብት ፈቃዱን ከተቀበለበት ቀን ጀምሮ በስድስት (፮) ወራት ውስጥ የኢንተርፕራይዙን ወይም ማስፋፊቱን ተግባር መጀመር አለበት ። ተቀባይነት ባለው ምክንያት በዚህ ጊዜ ውስጥ ለመጀመር ካልተቻለ ጽሕፈት ቤቱ ጊዜውን እንደ አስፈላጊነቱ ሊያራዝም ይችላል ።

፪. ባለሀብቱ የኢንተርፕራይዙን መቋቋም ወይም የመስፋፋት ሂደት በሚመለከት ጽሕፈት ቤቱ በሚያወጣው መመሪያ መሠረት በየጊዜው ሪፖርት ያቀርባል ።

19. *Progress Reports*

1. Any investor who has been issued with an investment certificate shall commence operating his enterprise or expansion within six (6) months of receipt of such certificate; where the investor fails for good cause to commence operating his enterprise or expansion within this period, the Office may extend the period as necessary.

2. The investor shall submit to the Office a progress report in accordance with directives issued by the Office, on the establishment process or on the implementation of the expansion programme.

፳. ፈቃዶችን ስለመሠረዝ

፩. በዚህ አዋጅ መሠረት የተሰጠን ማንኛውም ፈቃድ ጽሕፈት ቤቱ በቅድሚያ በጽሑፍ ከፈቀደ ለሌላ ሰው ማዛወር ይቻላል ።

፪. ከሚከተሉት ጥፋቶች ውስጥ አንዱ ተፈጽሞ ቢገኝ ጽሕፈት ቤቱ ማንኛውንም የተሰጠ ፈቃድ ይሰርዛል፣ ወይም እንዲሰረዝ ያደርጋል፣

ሀ) በማታለል ፣ የሀሰት ማስረጃ በማቅረብ ፣ወይም የተጭበረበረ መግለጫ በማቅረብ የተገኘ ከሆነ፣

20. *Cancellation of Licence*

1. Any licence issued pursuant to this Proclamation may be transferred to any other person upon prior approval by the Office.

2. The Office shall cancel or cause the cancellation of any licence on any one of the following grounds:

a) fraud, false and misleading facts or statements used for the purpose of obtaining certificate or licence;

ለ) ጽሕፈት ቤቱ አስቀድሞ ሳይስማማበት ማንኛውም ፈቃድ ወይም መብት ለሌላ ወገን ተላልፎ ከተገኘ ፣

ሐ) የተሰጡት ማበረታቻዎች ፣ መብቶች ፣መሬት ውሃ ወይም የተለያዩ አገልግሎቶች ከታቀዱላቸው ዓላማ ውጭ ለሌላ ሰው ተሰጥተው ወይም ለሌላ ተግባር ውለው የተገኙ እንደ ሆነ ፣

መ) ማንኛውም ኢንተርፕራይዝ ወይም መስፋፋት በዚሁ አዋጅ አንቀጽ ፲፱ ንዑስ አንቀጽ (፩) ላይ በተተመነለት ጊዜ ውስጥ ለመቋቋም ሳይችል ሲቀር ወይም መሥራት ሲያቆም ፣

ሠ) የአካባቢ መበከል ሲያደርስ ፣

ረ) በፈቃዱ ላይ የተወሰኑትንና መሟላት የሚገባቸውን ሁኔታዎች ያጓደለ ወይም የተላለፈ እንደሆን ፤

፫. በዚሁ አንቀጽ ንዑስ አንቀጽ ፪ እና ፫ የተደነገጉት እንደተጠበቁ ሆነው ፣ ጽሕፈት ቤቱ ፈቃዶችን ከመሰረዝ በተጨማሪ የሚከተሉትን እርምጃዎች ለመውሰድ ይችላል ።

ሀ) ገንዘብ ነክ ጥቅሞች ተመላሽ እንዲሆኑና እንዲሁም ጥቅም ላይ የዋሉ ማበረታቻዎችና መብቶች እንዲተኩ ማስገደድ ፣ እና

ለ) ካፒታል ፣ ትርፍ ፣ ጥቅም ፣ አበሎችና የክፍያ መብቶች ወደ ውጭ አገር እንዳይላኩ ማገድ ፤

፬. በዚሁ አንቀጽ ንዑስ አንቀጽ ፪ መሠረት ፈቃዱን ከመሠረዝና በንዑስ አንቀጽ ፫ የተመለከቱትን እርምጃዎች ከመውሰድ በተጨማሪ እንደድርጊቱ ባህርይ አግባብ ባላቸው የወንጀለኛ መቅጫ ሕግ ድንጋጌዎች መሠረት በጥፋተኛው ላይ የወንጀል ክስ ሊመሠረት ይቻላል ።

፳፩ ስለ አቤቱታ አቀራረብ

፩. ጽሕፈት ቤቱ በሰጠው ማንኛውም ውሳኔ ቅር የተሰኘ ባለሀብት ውሳኔውን በተቀበለ በአሥር (፲) ቀናት ውስጥ ቅሬታውን ለቦርዱ ማቅረብ ይችላል።

፪. ቦርዱ የቀረበለትን ቅሬታ ከመረመረ በኋላ የሚሰጠው ውሳኔ የመጨረሻና የጸና ይሆናል ።

፫. በዚሁ አንቀጽ ንዑስ አንቀጽ ፪ የተደነገገው ፍርድ ቤቶች የግለሰቦችን መብት ለማስከበር ያላቸውን ሥልጣን የሚሽር አይደለም ።

ምዕራፍ አራት

መንግሥትና መንግሥታዊ ኢንተርፕራይዞች ስለሚኖራቸው የኢንቨስትመንት ተሳትፎ

፳፪. ስለመንግሥትና መንግሥታዊ ኢንተርፕራይዞች የኢንቨስትመንት ተሳትፎ

፩. መንግሥት ወይም መንግሥታዊ ኢንተርፕራይዞችና የአገር ውስጥ ወይም የውጭ አገር ባለሀብቶች በቅንጅት ኢንቨስት ለማድረግ በሚፈልጉበት ጊዜ በአንቀጽ ፲፭ የተመለከተው የማመልከቻ አቀራረብና አፈቃቀድ እንዲሁም በአንቀጽ ፲፮ የተወሰነው ተፈጻሚ ይሆናል ።

b) transfer of any licence or any rights to another person without the prior approval of the Office;

c) unauthorized transfer to another person or application of incentives, rights, land, water or other services for purposes other than were originally indicated;

d) failure to complete the establishment process of an enterprise or expansion within the period specified under sub-Article (1) of Article 19 or closing down the operation thereof;

e) causing pollution of the environment; or

f) failure to sustain, or to comply with, the conditions and requirements subject to which licence is issued.

3. Without prejudice to the provisions of sub-articles 2 and 3 of this Article, the Office may, in addition to cancellation of licence,

a) demand all financial benefits to be refunded and incentives and privileges to be compensated;

b) block all remittances of capital, profits, interest, allowances and other payment rights.

4. Depending on the nature of the act, criminal prosecution may be brought against the offender under the appropriate provisions of the Penal Code in addition to the cancellation of the licence and the measures provided for in sub-Articles 2 and 3, respectively, of this Article.

21. *Procedures for Appeal*

1. An appeal against any decision of the Office may be submitted to the Board by an investor within ten (10) days of receipt of such decision.

2. After reviewing the case, the Board shall give its decision which shall be final and binding.

3. Nothing contained in sub-article 2 of this Article shall affect the jurisdiction of courts to protect the rights of persons.

CHAPTER FOUR
PARTICIPATION OF STATE ENTERPRISES IN INVESTMENT

22. *Government and Statement Enterprises as Investors*

1. Where the Government and state enterprises wish to invest as partners or in joint venture with domestic or foreign investors, the procedures for approval of investment application specified under Article 15 and the requirements of legal establishment specified under Article 16 shall apply.

፪. የኢንቨስትመንት ትንሹት በማድረግ በሽርክና ለመሳተፍ የሚፈልጉ ባለሀብቶች እያንዳንዳቸው የሚያዋጡት የኢንቨስትመንት ካፒታል መጠን በመመሥረቻው ጽሑፍ ውስጥ ይወሰናል ። ተሳታፊዎች በዓይነት የከፈሉት የካፒታል መዋጮ ከተገመገመ በኋላ ገለልተኛ በሆኑና በኢትዮጵያ ውስጥ በተመዘገቡ የሂሳብ አዋቂዎች ይረጋገጣል ።

፫. የመመሥረቻው ስምምነት በጽሕፈት ቤቱ ይጸድቃል ።

ምዕራፍ አምስት
ስለቴክኖሎጂ ሽግግር

፳፫. ስለቴክኖሎጂ ውል

፩. ማናቸውም ያገር ውስጥ ወይም የውጭ አገር ባለሀብት ከኢንቨስትመንት ጋር በተዛመደ መልኩ የቴክኖሎጂ ውል ለመዋዋል በሚፈልግበት ጊዜ ይህንኑ ለጽሕፈት ቤቱ በማቅረብ ፈቃድ ማግኘትና ማስመዝገብ አለበት ።

፪. ጽሕፈት ቤቱ የተጠቀሰው የቴክኖሎጂ ውል ሲደርሰው ለግምገማ ወደሚመለከተው አካል ያስተላልፍለታል ። የሚመለከተው አካል ግምገማውን በሃያ (፳) ቀናት ውስጥ አከናውኖ ለጽሕፈት ቤቱ ያስተላልፋል ።

፫. ማናቸውም የቴክኖሎጂ ውል ሊታደስ የሚችለው በሚመለከተው አካል ተገምግሞ ጠቃሚነቱ ሲረጋገጥ ብቻ ይሆናል ።

፬. በዚህ አንቀጽ ንውስ አንቀጽ ፩ እና ፫ መሠረት የቴክኖሎጂ ውሎች የሚገመገሙት የሚኒስትሮች ምክር ቤት በሚያወጣው ደንብ በተገለጹት መሥፈርቶች መሠረት ነው ።

ምዕራፍ ስድስት
ስለብድርና ገንዘብ ወደ ውጭ አገር ስለሚዛወርበት ሁኔታ

፳፬. ከውጭ የሚገኝ ብድር

፩. ማናቸውም ባለሀብት ፣ ኢንተርፕራይዝ ወይም መስፋፋት ከውጭ አገር ያገኘውን ብድር ወደ አገር ውስጥ ሲያስገባ በኢትዮጵያ ብሔራዊ ባንክ ማስመዝገብ አለበት ።

፪. የኢትዮጵያ ብሔራዊ ባንክ የዚህን አዋጅ ዓላማዎች አፈጻጸም ለማመቻቸት የሚበጁ ፖሊሲዎች ፣ ደንቦችና መመሪያዎች ያወጣል ወይም እንዲወጡ ያደርጋል ።

፳፭. ስለውጭ ምንዛሪ አጠቃቀም

፩. በአንቀጽ ፲፫ ንውስ አንቀጽ (፲፩) መሠረት የውጭ ምንዛሪ የሚያስገኝ ባለሀብት ፣ ኢንተርፕራይዝ ወይም መስፋፋት የኢትዮጵያ ብሔራዊ ባንክ በሚያወጣው ደንብ መሠረት በውጭ ምንዛሪ የባንክ ሂሳብ በአገር ውስጥ ሊከፍትና ሊያንቀሳቅስ ይችላል ።

2. The amount of investment capital to be contributed by each investor intending to participate as a partner of such joint investment shall be prescribed in the memorandum of association. The value of the portion of the investment capital contributed in kind by the partners shall be assessed by experts and verified by independent accountants registered in Ethiopia.

3. The memorandum of association shall be approved by the Office.

CHAPTER FIVE
TRANSFER OF TECHNOLOGY

23. *Technology Agreement*

1. Where a domestic investor or a foreign investor intends to conclude a technology agreement related to his investment, he shall submit same to the Office for approval and registration.

2. On receiving such technology agreement, the Office shall refer the agreeemnt to the appropriate authority for evaluation. The appropriate authority shall give its evaluation to the Office within twenty (20) days.

3. Any technology agreement may be renewed on the recommendation of the appropriate authority.

4. Technology agreements shall be evaluated pursuant to sub-article 1 and 3 of this Article on the basis of the standards prescribed by regulations issued by the Council of Ministers.

CHAPTER SIX
LOANS AND CONDITIONS FOR REMITTANCES

24. *External Loan*

1. An investor, enterprise or expansion which acquires an external loan shall have such loan registered with the National Bank of Ethiopia.

2. The National Bank of Ethiopia shall lay down policies, rules and directives which facilitate the implementation of the investment objectives of this Proclamation.

25. *Utilisation of Foreign Currency*

1. An investor, enterprise or expansion which earns foreign exchange pursuant to sub-article (11) of Article 13 may open and operate a foreign currency account in accordance with the regulations of the National Bank of Ethiopia.

፪. በገቢ ወይም በትርፍ መልክ የውጭ ምንዛሪ ያገኘ ማንኛውም ባለሀብት ፣ ኢንተርፕራይዝ ፣ ወይም መስፋፋት ከዚሁ ውስጥ የብሔራዊ ባንክ በሚያ ወጣው ደንብ ወይም መመሪያ መሠረት የሚወሰን ድርሻ በመያዝ ከውጭ አገር መግሪያ ፣ ዕቃ ፣ ጥሬ ዕቃ ፣ መለዋወጫ ዕቃና ሌሎች ተፈላጊ ግዥዎች ንና ተጨማሪ ቁሳቁሶችን ለማስመጣት የውጭ ምን ዛሪ ከኢትዮጵያ ብሔራዊ ባንክ ለማግኘት በማይ ቻልበት ጊዜ ሊጠቀምበት ይችላል ።

፫. የተጠራቀመ ትርፍን በሚመለከት የዚህ አዋጅ አን ቀጽ ፲፫ ንውስ አንቀጽ ፫ በሚደነግገው መሠረት ተፈጻሚ ይሆናል ።

፳፮. ገንዘብ ወደ ውጭ አገር ስለማዛወር

፩. በዚህ አዋጅ ውስጥ በሌሎች አንቀጾች ላይ የተደ ነገጉት እንደተጠበቁ ሆነው ፣ ማንኛውም የውጭ አገር ባለሀብት ከዚህ ቀጥሎ የተዘረዘሩትን ክፍያ ዎች ወደ ኢትዮጵያ ባስገባበት የውጭ ምንዛሪ ዓይ ነት ወይም በሌላ በተፈቀደ የውጭ ምንዛሪ ለማስ ወጣት በሚጠይቅበት ቀን ባለው የምንዛሪ ተመን መሠረት ከኢትዮጵያ ውጭ ለማዛወር ይችላል ።

ሀ) ከኢንቨስትመንት ካፒታል የተገኘ ትርፍና የትርፍ ድርሻ ፣

ለ) ከውጭ አገር በብድር የሚገኝ ዋና ገንዘብና ወለድ ፣

ሐ) ከኢንቨስትመንቱ ጋር ግንኙነት ባለው የቴ ክኖሎጂ ወይም የሥራ አመራር ስምምነት ምክንያት የሚከፈሉ ገንዘቦች ፣ ጥቅሞች ወይም ሌሎች ክፍያዎች ፣

መ) የውጭ አገር ባለሀብት ወይም ኢንተርፕራ ይዝ በኪሣራ ምክንያት ሥራውን ሲዘጋ ከን ብረት ሽያጭ የሚገኝ ገንዘብ ፣

ሠ) አክሲዮኖች ለአገር ውስጥ ባለሀብት በሚዛ ወሩበት ወይም በሚሸጡበት ጊዜ የተገኘ ገንዘብ ወይም ኢንተርፕራይዙ በከፊል ወይም በሙሉ በአገር ውስጥ ባለሀብት ባለቤትነት ሥር ሲደረግ የሚከፈል ገንዘብ ፣

፪. በኢንተርፕራይዝ ወይም መስፋፋት ውስጥ ተቀጥ ረው የሚሠሩ የውጭ አገር ዜጐች ያገኙትን ደመ ወዝና ሌሎች ክፍያዎች የኢትዮጵያ የውጭ ምን ዛሪ ደንብ በሚፈቅደው መሠረት ወደ ውጭ አገር ለመላክ ይችላሉ ።

ክፍል ሁለት
የኢንቨስትመንት አስተዳደር
ምዕራፍ ሰባት

ስለኢትዮጵያ ኢንቨስትመንት ጽሕፈት ቤት

፳፯. የኢንቨስትመንት አስተዳደር

የኢንቨስትመንት አስተዳደር የሚከተሉት ክፍሎች ይኖሩታል ፣

2. An investor, enterprise or expansion which earns foreign currency may retain a portion of such earnings as may be determined by regulations or directives of the National Bank of Ethiopia and, where foreign currency is not readily available by the National Bank of Ethiopia, the earnings so retained may be used to acquire machinery, equipment, raw materials, spare-parts and other needed supplies and inputs.

3. Sub-Article 12 of Article 13 shall apply with respect to the reinvestment of accumulated profits.

26. *Remittance of Funds*

1. Without prejudice to the other provisions of this Proclamation, a foreign investor may make the following remittances out of Ethiopia in the currency of investment or in an approved currency at the prevailing rate of exchange on the date of remittance:

a) profits and dividends accruing from investment;

b) principal and interest on a foreign loan;

c) fees, royalties or any other payments accruing pursuant to a technology or management agreement relating to the investment;

d) proceeds from sales of assets upon the liquidation or winding up of the business of a foreign investor or enterprise due to bankruptcy;

e) payment from the sale or transfer of shares of an investment or acquisition in part or in whole of an enterprise by a domestic investor.

2. Expatriates employed in an enterprise or expansion may remit salaries and other payments accruing from their employment in accordance with the foreign exchange regulations of Ethiopia.

PART TWO
INVESTMENT ADMINISTRATION
CHAPTER SEVEN
INVESTMENT OFFICE OF ETHIOPIA

27. *Administration of Investment*

The following organs shall be established for the administration of investment:-

፩. የኢንቨስትመንት ቦርድ
፪. የኢንቨስትመንት ጽሕፈት ቤት ፤
፫. ዋና ሥራ አስኪያጅ ፣ ምክትል ዋና ሥራ አስኪያጅና
፬. አስፈላጊ የሆኑ ሠራተኞች ፡

፳፰. የኢንቨስትመንት ቦርድ

፩. የጽሕፈት ቤቱን ሥልጣንና ተግባራት አፈጻጸም በበላይነት የሚከታተልና የሚቆጣጠር የኢንቨስትመንት ቦርድ ይኖራል ።

፪. ቦርዱ ተጠሪነቱ ለሚኒስትሮች ምክር ቤት ሆኖ የሚከተሉት አባላት ይኖሩታል ፤

ሀ) ጠቅላይ ሚኒስትር . . . . . . ሰብሳቢ
ለ) የፕላንና የኢኮኖሚ ልማት ሚኒስትር . . . . ም/ሰብሳቢ
ሐ) የገንዘብ ሚኒስትር . . . . . . አባል
መ) የውጭ ጉዳይ ሚኒስትር . . . »
ሠ) የግብርና የአካባቢ ጥበቃና ልማት ሚኒስትር . . . . »
ረ) የኢንዱስትሪ ሚኒስትር . . . . . . »
ሰ) የውጭ ኢኮኖሚ ትብብር ሚኒስትር . . »
ሸ) የኢትዮጵያ ብሔራዊ ባንክ ዋና አስተዳዳሪ »
ቀ) የኢትዮጵያ ንግድ ምክር ቤት ዋና ጸሐፊ . . »
በ) በሚኒስትሮች ም/ቤት የብሔራዊ ክልላዊ መስተዳድር ተጠሪ . . . . »
ተ) የጽሕፈት ቤቱ ዋና ሥራ አስኪያጅ . . . አባልና ጸሐፊ
ቸ) የንግድ ሚኒስትር . . . . . . አስረጅ
ኀ) የኢትዮጵያ ሳይንስና ቴክኖሎጂ ኮሚሽን ኮሚሽነር . . . . »
ነ) ኢንቨስትመንት በተፈቀደበት መስክ የሚመለከተው አካል የበላይ ኃላፊ . . . . . »
ኘ) የአገር ውስጥ ጉዳይ ሚኒስትር . . . አስፈላጊ ከሆነ በአስረጂነት ይገኛል ፤

፳፱. የቦርዱ ስብሰባዎች

፩. ቦርዱ እንደሥራው አስፈላጊነት ለመሰብሰብ የሚችል ሲሆን በወር አንድ ጊዜ መደበኛ ስብሰባ ይኖረዋል ።

፪. ሰብሳቢው ቦርዱን ለስብሰባ የሚጠራ ሲሆን እሱ በማይገኝበት ጊዜ ምክትል ሰብሳቢው የቦርዱን ስብሰባዎች ለመምራት ይችላል ። ሰብሳቢውና ምክትል ሰብሳቢው በማይገኙበት ጊዜ ሰብሳቢው የሚወክለው አባል ስብሰባ ለመምራት ይችላል ።

፫. ሰብሳቢውን ጨምሮ ከቦርዱ አባላት ውስጥ ሁለት ሦስተኛ (2/3) የሚሆኑ በስብሰባው ላይ ሲገኙ ምልዓተ ጉባኤው ይሟላል ።

፬. የቦርዱ ውሳኔዎች የሚጸኑት በስብሰባው ላይ የተገኙ አባላት በሚሰጡት የድምጽ ብልጫ መሠረት ይሆናል ።

፭. ቦርዱ በሚያደርጋቸው ስብሰባዎች ላይ አማካሪዎች መሰየም ይችላል ።

፮. ከላይ የተደነገገው እንደተጠበቀ ሆኖ ፤ ቦርዱ ዝርዝር የስብሰባ ሥነ ሥርዓት ለማውጣት ይችላል ።

1. a Board of Investment;
2. an Office of Investment;
3. a General Manager and a Deputy General Manager; and
4. The necessary staff.

28. *The Board of Investment*

1. There shall be a Board of Investment which shall follow up and supervise the execution of the powers and duties of the Office.

2. The Board shall be accountable to the Council of Ministers and shall be constituted as follows:-

a) the PrimeMinister . . . . Chairman
b) the Minister of Planning and Economic Development . . . . Vice Chairman
c) the Minister of Finance . . . . Member
d) the Minister of Foreign Affairs . . . Member
e) the Minister of Agriculture, Environmental Protection and Development . . . . "
f) the Minister of Industry . . . . "
g) the Minister of External Economic Cooperation . . . . "
h) the Administrator of the National Bank of Ethiopia . . . . "
i) the Secretary General of the Ethiopian Chamber of Commerce . . . . "
j) the Head of the National/Regional Self-Governments Affairs of the Council of Ministers . . . . "
k) the General Manager of the Office . . . . Member & Secretary
l) the Minister of Trade . . . . non-voting member
m) the Commissioner of the Ethiopian Science and Technology Commission . . . . "
n) the Head of the appropriate authority concerned with the area of investment . . . . "
o) the Minister of Internal Affairs . . . . . . non-voting member as may be necessary.

29. *Meetings of the Board*

1. The Board shall meet as often as its business requires, but it shall have its regular meeting once a month.

2. The Board shall convene upon the call of the Chairman, and in his absence, it shall convene upon the call of the Vice-Chairman. In the absence of the Chairman and the Vice-Chairman, it shall convene upon the call of the person delegated by the Chairman.

3. The presence of at least two-thirds (2/3) of the members of the Board including the Chairman shall constitute a quorum.

4. Decision in any meeting of the Board shall be made by a majority vote of those present in the meeting.

5. The Board may co-opt experts to act as advisors at any of its meetings.

6. Without prejudice to the provisions of the foregoing sub-articles, the Board may prescribe its own rules of procedure.

፴. <u>የቦርዱ ሥልጣንና ተግባር</u>

ቦርዱ ከዚህ የሚከተሉት ሥልጣንና ተግባር ይኖሩታል ፤

፩. የጽሕፈት ቤቱን ተግባርና ሥልጣን አፈጻጸም በበላይነት ይከታተላል ፣ ይቆጣጠራል ።

፪. በዚህ አንቀጽ ንዑስ አንቀጽ (፩) እና በዚህ አዋጅ ሌሎች አንቀጾች የተሰጠው ሥልጣን እንደተጠበቀ ሆኖ ፤ ቦርዱ የሚከተሉት ሥልጣንና ተግባር ይኖረዋል ፤

ሀ) ኢንቨስትመንትን የሚመለከቱ የፖሊሲ ጉዳዮች ያመነጫል ፤ እንዲፈቀድ ያደርጋል ፤

ለ) በዚህ አዋጅ መሠረት የሚደረጉት የኢንቨስትመንት እንቅስቃሴዎች በሚመለከተው አካል መፈጸማቸውን ይከታተላል ፤ ይቆጣጠራል ፤ ያስተባብራል ፤

ሐ) በዚህ አዋጅ መሠረት የተደረገውን የኢንቨስትመንት እንቅስቃሴ ሪፖርት ያዳምጣል ተገቢውን ውሳኔ ይሰጣል ፤

መ) የጽሕፈት ቤቱን ዓመታዊ የሥራ ፕሮግራምና በጀት ያጸድቃል ፤

ሠ) መንግሥት ከግል ባለሀብቶች ጋር በቅንጅት ወይም በሽርክና የሚያደርገውን ኢንቨስትመንት ያጸድቃል ፤

ረ) ጽሕፈት ቤቱ በዚህ አዋጅ መሠረት ለሚሰጠው አገልግሎት ሊያስከፍል የሚችለውን ተመጣጣኝ የአገልግሎት ዋጋ ይወስናል ፤

ሰ) የኦዲትና የሥራ አፈጻጸም ሪፖርት ያዳምጣል ፤ ተገቢውን ውሳኔ ይሰጣል ።

ሸ) ከኢንቨስተሮች የሚቀርቡትን የይግባኝ አቤቱታዎች ይወስናል ፤

ቀ) የአዋጁን አፈጻጸም በሚመለከት ሌሎች ጉዳዮችን ይወስናል ፤ ተግባራዊነታቸውንም ያረጋግጣል ።

፫. ቦርዱ ተግባሩንና ሥልጣኑን እንደ አስፈላጊነቱና እንደሁኔታው በከፊል ለጽሕፈት ቤቱ ዋና ሥራ አስኪያጅ በውክልና ሊሰጥ ይችላል ።

፴፩. <u>የጽሕፈት ቤቱ መቋቋም</u>

፩. የኢንቨስትመንት ጽሕፈት ቤት በዚህ አዋጅ ተቋቁሟል ።

፪. ጽሕፈት ቤቱ ተጠሪነቱ ለቦርዱ ይሆናል ።

፴፪. <u>የጽሕፈት ቤቱ ሥልጣንና ተግባር</u>

፩. ጽሕፈት ቤቱ ከዚህ ቀጥሎ የተዘረዘሩት ሥልጣንና ተግባራት ይኖሩታል ፤

ሀ) በዚህ አዋጅ የተዘረዘሩትን የኢንቨስትመንት ዓላማዎችና ተግባሮች በማዕከልነት አመራር መስጠት ፣ ማስተዋወቅና ግንኙነቶችን ማስተባበር ፤

30. *Powers and Duties of the Board*

The Board shall have the following powers and duti-

1. to follow up and supervise the execution of the ... and duties of the Office;

2. without prejudice to sub-Article (1) above and other provisions of this Proclamation, the Board shall have the following powers and duties:

   a) to initiate, submit recommendations on and obta... the approval of policy matters with respect to investment;

   b) to follow up, supervise and coordinate the implementation, by the appropriate authorities, of investment activities under this Proclamation;

   c) to examine and approve report with respect to investment activities under this Proclamation;

   d) to approve the annual work programme and budget of the Office;

   e) to approve investment to be made by the Government jointly or in partnership with private investors;

   f) to determine the appropriate fees and charges to be collected by the Office for the services it renders pursuant to this Proclamation;

   g) to examine auditors' and progress reports and to give appropriate decisions thereon;

   h) to decide on any appeal submitted to it by investors.

   i) to decide on other matters pertaining to the implementation of this Proclamation, and to ensure the implementation of same.

3. The Board may, where necessary, delegate part of its powers and duties to the General Manager, as the case may be.

31. *Establishment of the Office*

1. There is hereby established an Office of Investment.

2. The Office shall be accountable to the Board.

32. *Powers and Duties of the Office*

1. The Office shall have the following powers and duties:

   a) as a focal organization, to give guidance to, and to promote and coordinate contacts in respect of, the investment objectives and activities provided for in this Proclamation;

ለ) በኢትዮጵያ ውስጥ የሚገኘውን የሀብት ክምችትና የኢንቨስትመንት ዕድል መረጃዎች መሰብሰብ ፣ ማቀናጀት ፣ መተንተን ፣ ማሠራጨት፣ ተጨባጭ የኢንቨስትመንት ፕሮጀክቶችን ማስተዋወቅ ፣

ሐ) ኢንተርፕራይዞችን ወይም የመስፋፋት ሥራዎችን ለማቋቋምና ለማካሄድ የሚቀርቡ ማመልከቻዎችን መቀበል ፣ መገምገም ፣ መመርመርና መወሰን ፣

መ) ለኢንቨስትመንት የሚቀርቡ ሐሳቦችን ሟሟላት የሚገባቸውን መመዘኛዎች ማዘጋጀት ፣

ሠ) በባለሀብቶችና ጉዳዩ በሚመለከታቸው ሌሎች አካላት መካከል የኢንቨስትመንት ተግባሮችን ማስተባበር ፣መከታተልና መቆጣጠር ፣

ረ) የዚህን አዋጅ አፈጻጸም በሚመለከት ማብራሪያ መስጠት ፣

ሰ) ኢንቨስትመንትን አስመልክቶ ተገቢውን አገልግሎት መስጠት ፣

ሸ) በዚህ አዋጅ መሠረት የተደረጉ ስምምነቶችንና ማሻሻያዎችን መዝግቦ መያዝ ወይም መጠበቅ ፣

፪. ይህን አዋጅ ስኬታማ በሆነ መንገድ ወደ አፈጻጸም ለማሸጋገር ፣

ሀ) ደንቦችን ፣መመሪያዎችንና የአሠራር ሥልቶችን ማዘጋጀት ፣ ሲፈቀድም ተግባራዊ ማድረግ ፣

ለ) ሥልጠና ፣ ወርክሾፕ ፣ አውደ ጥናትና ሴሚናር ወዘተ ... ማዘጋጀትና መስጠት ፣

፫. የዚህን አዋጅ ዓላማዎች ለማከናወን አስፈላጊና ተገቢ የሆኑትን ማናቸውንም ሌሎች ተግባሮች ሁሉ መፈጸም ፣ ወይም እንዲፈጸሙ ማድረግ ።

፴፫. **የጽሕፈት ቤቱ ዋና ሥራ አስኪያጅ**

፩. ዋናው ሥራ አስኪያጅ በመንግሥት ይሾማል ።

፪. ዋናው ሥራ አስኪያጅ የጽሕፈት ቤቱ የበላይ ሥራ አስፈጻሚ ሆኖ የቦርዱን ጠቅላላ መመሪያ በመከተል የጽሕፈት ቤቱን ተግባርና ሥልጣን ያከናውናል።

፫. በዚህ አንቀጽ ንዑስ አንቀጽ /፪/ የተደነገገው እንደ ተጠበቀ ሆኖ ዋናው ሥራ አስኪያጅ ከዚህ የሚከተሉትን ያከናውናል ፣

ሀ) ለቦርዱ ተገቢ ውሣኔዎችን ለመስጠትና ፖሊሲዎችን ለማመንጨት የሚረዱ ወቅታዊ መረጃዎችን ያቀርባል ፣

ለ) የመንግሥት ሠራተኞችን የአስተዳደር ሕግ መሠረታዊ መርሆዎች በመከተል ሠራተኞችን ይቀጥራል ፣ ያስተዳድራል ፣ ያሰናብታል ፣

ሐ) የጽሕፈት ቤቱን ዓመታዊ የሥራ ፕሮግራምና በጀት በማዘጋጀት ለቦርዱ አቅርቦ ካስፈቀደ በኋላ እንደ አስፈላጊነቱ ለመንግሥት ያቀርባል ሲፈቀድም በሥራ ላይ ያውላል ፣

መ) በጽሕፈት ቤቱ ስም የሚደረጉትን ማናቸውንም ስምምነቶችና የውል ሰነዶች ይፈርማል ፣

b) to collect, process, analyze and disseminate information on investment opportunities and potentials in Ethiopia and to promote concrete investment projects;

c) to receive, review, screen and decide on applications for the establishment and operation of enterprises or expansions;

d) to prepare standard criteria that need to be fulfilled by investment proposals;

e) to coordinate, follow-up and monitor investment matters involving investors and other concerned organs;

f) to make the necessary elaborations regarding the implementation of this Proclamation;

g) to provide the proper services with respect to investment;

h) to register and keep agreements and amendments thereof made in accordance with this Proclamation.

2. In order to advance this Proclamation towards successful implementation:

a) to prepare regulations, directives and devises and to implement same when approved;

b) to organize and offer training, workshops, seminars etc.

3. To carry out or cause the carrying out of such activities as are necessary and proper for the attainment of the objective of his Proclamation.

33. *The General Manager*

1. The General Manager shall be appointed by the Government.

2. The General Manager shall be the chief executive officer of the Office and shall carry out the power and duties of the Office in accordance with the overall directions of the Board.

3. Without prejudice to the generality of sub-Article 2 of this Article, the General Manager shall:

a) furnish up-to-date information necessary for the formulation of appropriate decisions and initiation of policies by the Board;

b) employ, administer and dismiss personnel in line with the basic principles of public service laws;

c) prepare and with the prior approval of the Board, submit to the Government, as may be necessary, the annual work programme and budget of the Office and implement same upon approval;

d) sign any agreements and contractual documents on behalf of the Office;

ሠ) በየሶስት ወሩ ስለጽሕፈት ቤቱ የሥራ እንቅስ ቃሴ ሪፖርት ለቦርዱ ያቀርባል ፤

ረ) በጽሕፈት ቤቱ ስም የባንክ ሂሣብ ይከፍታል ያንቀሳቅሳል ፤

ሰ) ጽሕፈት ቤቱን በሶስተኛ ወገኖች ዘንድ ይመ ክሳል ፤

ሸ) ጉዳዮችን ከፍርድ ቤት ውጭ ተስማሚ መስሎ ባገኘው መንገድ እንዲወሰኑ ለማድረግ ይችላል ፤

ቀ) ይህን አዋጅ ለማስፈጸም አስፈላጊ የሆኑትን ፖሊሲ ነክ ጉዳዮችና በቦርዱ መወሰን ስለሚ ገባቸው ጉዳዮች የውሣኔ አስተያየቶች ለቦርዱ ያቀርባል ፤

በ) በዚህ አዋጅ መሠረት የተሰጠውን ሥልጣንና ተግባሮች ተገቢ መስሎ በታየው መንገድ ለመ ወከልና እንዲሁም ለጽሕፈት ቤቱ ምክትል ዋና ሥራ አስኪያጅና ለሠራተኞች ለማደላደል ይችላል ፤

፴፫. የጽሕፈት ቤቱ ምክትል ዋና ሥራ አስኪያጅ

፩. ምክትል ዋና ሥራ አስኪያጅ በመንግሥት ይሾማል።

፪. ምክትል ዋና ሥራ አስኪያጁ ዋናው ሥራ አስኪያጅ በሚሰጠው መመሪያ መሠረት የሚከተሉትን ያከና ውናል ፦

ሀ) የፕላን ዕቅዶችንና ፕሮግራሞችን ፣ የአስተዳደር ተግባሮችንና ሌሎችን የሥራ እንቅስቃሴዎች በመከታተል ዋና ሥራ አስኪያጁን ይረዳል ፤

ለ) ዋናው ሥራ አስኪያጅ በማይኖርበት ጊዜ የጽሕፈት ቤቱን ተግባሮች ይመራል ፤

ሐ) የሚሰጡትን ሌሎች ተግባሮች ያከናውናል ።

ምዕራፍ ስምንት
የጽህፈት ቤቱ የፋይናንስ ድንጋጌዎች

፴፭. የገቢ ምንጭ

፩. ጽሕፈት ቤቱ ከዚህ ቀጥሎ ከተዘረዘሩት ምንጮች የሚገኝ ገቢ ይኖረዋል ፦

ሀ) መንግሥት በበጀት መድቦ የሚሰጠው ገን ዘብ ፤

ለ) ከአገልግሎት የሚሰበሰበው ተገዘብ ፤

ሐ) ከማናቸውም ሌላ ምንጭ የሚያገኘው ገቢ ፤ ዕርዳታና ስጦታ ፤

፪. በዚህ አንቀጽ ንውስ አንቀጽ (፩) ከተመለከቱት ምንጮች የተሰበሰበውን ገቢ ጽሕፈት ቤቱ በዚህ አዋጅ ውስጥ ለተጠቀሱት ዓላማዎችና ተግባሮች ማስፈጸሚያ ይጠቀምበታል ።

፴፮. የሂሣብ መዛግብት

፩. የጽሕፈት ቤቱ የሂሣብ ዘመን ሐምሌ ፩ ቀን ጀምሮ ሰኔ ፴ ቀን ይፈጸማል ።

፪. ጽሕፈት ቤቱ ተገቢ የሆኑ የሂሣብ መዛግብትና ሰነዶች ይጠብቃል ።

፫. የጽሕፈት ቤቱ የሂሣብ መዛግብትና ሰነዶች ቢያንስ በዓመት አንድ ጊዜ በዋናው ኦዲተር መሥሪያ ቤት ወይም ዋናው ኦዲተር በሚሰይማቸው ሌሎች የሂ ሣብ አዋቂዎች ይመረመራሉ ።

e) submit to the Board every three months report on the activities of the Office;

f) open and operate bank accounts in the name of the Office;

g) represent the Office with third parties;

h) settle disputes out of court as he may deem it appropriate;

i) submit to the Board recommendation on policy matters necessary for the implementation of this Proclamation and on matters which need to be decided by the Board;

j) delegate part of his powers and functions under this Proclamation to the Deputy General Manager and to the staff of the Office in such manner as he deems appropriate.

34. *The Deputy General Manager*

1. The Deputy General Manager shall be appointed by the Government.

2. The Deputy General Manager shall, subject to the directions of the General Manager:

a) assist the General Manager in planning and programming, administering, coordinating and following up the activities of the Office;

b) direct the activities of the Office in the absence of the General Manager;

c) carry out such other duties as may be assigned to him.

CHAPTER EIGHT
FINANCIAL PROVISIONS OF THE OFFICE

35. *Source of Income*

1. The Office shall have income from the following sources:-

a) budgetary allocations provided by the Government;

b) fees and charges to be collected for service rendered;

c) income, assistance and grants obtained from any other sources.

2. The income obtained from the sources referred to in sub-Article (1) of this Article shall be used by the Office for the implementation of the objectives and activities specified under this Proclamation.

36. *Books of Account*

1. The fiscal year of the Office shall begin on the 1st day of Hamle and end on the 30th day of Sene.

2. The Office shall keep and maintain appropriate books of account and financial records.

3. The books of account and the financial records of the Office shall be audited at least once a year by the Auditor General's Office or by other auditors authorized by the Auditor General.

ምዕራፍ ዘጠኝ

ልዩ ልዩ ድንጋጌዎች

፴፯. በማዕድን ስለሚደረግ ኢንቨስትመንት

የዚህን አዋጅ ዓላማዎችና መሠረታዊ መርሆዎች በመከተል በማዕድን ከፍለ ኢኮኖሚ ኢንቨስት ስለሚደርግበት ሁኔታና ማበረታቻ አፈቃቀድ አግባብ ባለው የማዕድን ሕግ መሠረት ይወሰናል ።

፴፰. የመተባበር ግዴታ

በዚህ አዋጅ ውስጥ በተደነገጉት ጉዳዮች ላይ የሚመለከተው አካል የመተባበር ግዴታ አለበት ፣

፴፱. የክርክር አወሳሰን

፩. በውጭ ኢንቨስትመንት ምክንያት የሚነሱ ክርክሮች የውጭ ባለሀብትን ወይም መንግሥትን የሚጨምሩ ከሆነ ስለክርክሮቹ አወሳሰን የሚመለከታቸው ወገኖች ምርጫቸውን በስምምነት ሊወስኑ ይችላሉ ።

፪. በንዑስ አንቀጽ (፩) የተደነገገው እንደተጠበቀ ሆኖ፣ በውጭ ኢንቨስትመንት ምክንያት የሚነሱ ክርክሮች ኢትዮጵያ በተቀበለቻቸው ወይም አባል በሆነች ባቸው ዓለም አቀፍ የክርክር መወሰኛ ሥርዓቶች መሠረት ተገቢውን አወሳሰን ሊያገኙ ይችላሉ ።

፵. የተሻሩ ሕጐች

፩. የሚከተሉት በዚህ አዋጅ ተሽረዋል ፣

ሀ) የጋራ ልማት ማኅበር አዋጅ ቁጥር ፴፪/፲፱፻፹፱

ለ) ስለኢንቨስትመንት የወጣ የመንግሥት ምክር ቤት ልዩ ድንጋጌ ቁጥር ፲፯/፲፱፻፹፪ ፣

ሐ) የግብርና ሥራ ሬቃድ የሚኒስትሮች ምክር ቤት ደንብ ቁጥር ፯/፲፱፻፹፪ ከአንቀጽ ፲፫-፳፩ እና ከደንቡ ጋር ተያይዘው የሚገኙት መገጠ ረሻ ፩ እና ፪ ፣

መ) የውጭ ኢንቨስተሮች ተሳትፎ የሚኒስትሮች ምክር ቤት ደንብ ቁጥር ፲/፲፱፻፹፪ ።

፪. ይህን አዋጅ የሚቃረኑ የማናቸውም ሕግ ፣ ደንብ ወይም መመሪያ ድንጋጌዎችና የአሠራር ልምዶች በዚህ አዋጅ ውስጥ የተወሰኑትን ጉዳዮች በሚመለከት ተፈጻሚነት አያኖራቸውም ።

፵፩. የመሸጋገሪያ ድንጋጌዎች

፩. በዚህ አዋጅ አንቀጽ ፵ የተደነገገው ቢኖርም ፣ በተሻሩት ሕጐችና ደንቦች መሠረት የተቋቋሙ ኢንተርፕራይዞች ፣ የተደረጉ ማስፋፋቶች ፣የተሰጡ ማበረታቻዎች ፣ መብቶችና ጥቅሞች በተጠቀሱት ሕጐችና ደንቦች መሠረት ተፈጻሚነታቸውን ይቀጥላሉ ።

CHAPTER NINE

MISCELLANEOUS PROVISIONS

37. *Investment in Mining*

The conditions of investment and approval of incentives relating to the mining sector shall be determined in accordance with the appropriate law issued in line with the investment objectives and the basic principles of this Proclamation.

38. *Duty to Cooperate*

The appropriate authority shall have the duty to cooperate in respect of matters provided for in this Proclamation.

39. *Settlement of Disputes*

1. Disputes arising out of foreign investment which involve a foreign investor or the State, may be settled in accordance with the choice made by the agreement of the concerned parties.

2. Without prejudice to the provisions of sub-article 1 of this Article, disputes arising out of foreign investment may be settled in accordance with international dispute settlement procedures which are accepted by Ethiopia or of which Ethiopia is a party.

40. *Repeal*

1. The following are hereby repealed:

   a) The Joint Venture Proclamation No. 32/1989;

   b) Council of State Special Decree No. 17/1990 on Investment;

   c) Issuance of Licences for Agricultural Activities, Council of Ministers Regulations No. 7/1990 from Articles 13 to 21 and Schedules 1 and 2 thereof;

   d) Participation of Foreign Investors, Council of Ministers Regulations No. 10/1990.

2. Any law, regulations, directives, provisions and practices which are inconsistent with this Proclamation shall not apply with respect to matters provided for in this Proclamation.

41. *Transitory Provisions*

1. Notwithstanding the provisions of Article 40 of this Proclamation, any enterprise established, expansion implemented, incentives granted or any other rights acquired under laws and regulations repealed hereby shall continue in force in accordance with said laws and regulations.

፪. በዚህ አንቀጽ ንውስ አንቀጽ (፩) የተደነገገው ቢና ርም ፣ በተሻሩት ሕጐችና ደንቦች መሠረት የተቋ ቋሙ ኢንተርፕይዞችና የተደረጉ ማስፋፋቶች በዚህ አዋጅ አንቀጽ ፲፩ ላይ በተዘረዘሩት የሥራ መስኮች የተሠማሩ እስከሆኑና በአንቀጽ ፲፪ ላይ የተመለከቱ ትን ሁኔታዎች አሟልተው እስከተገኙ ድረስ በልዩ ንቱ ላይ ተጣይ ስሉት ተደርጎ በዚህ አዋጅ የተ ፈቀዱትን ማበረታቻዎች ቢተዉማሪ ለማግኘት ይችላሉ ።

2. Nothwithstanding the provisions of sub-Article (1) of this Article, enterprises and expansions established pursuant to laws and regulations repealed hereby may be entitled to the differential incentives under this Proclamation, provided that they are engaged in the areas of investment specified under Article 11 and fulfill the conditions prescribed in Article 12 of this Proclamation.

፫. ይህ አዋጅ ከመጽናቱ በፊት ለጽሕፈት ቤቱ የቀረቡ የኢንቨስትመንት ጥያቄዎች በዚህ አዋጅ መሠረት ተፈጸሚ ይሆናሉ ።

3. Any applications submitted to the Office before the effective date of this Proclamation and pending for decision shall be dealt with in accordance with this Proclamation.

፵፪. <u>አዋጁ የሚጸናበት ጊዜ</u>

ይህ አዋጅ በነጋሪት ጋዜጣ ታትሞ ከወጣበት ቀን ጀምሮ የጸና ይሆናል ።

42. *Effective Date*

This Proclamation shall enter into force on the date of its publication in the Negarit Gazeta.

አዲስ አበባ ግንቦት ፲፯ ቀን ፲፱፻፹፬

መለስ ዜናዊ

የኢትዮጵያ የሽግግር መንግሥት

ፕሬዚዳንት

Done at Addis Ababa, this 25th day of May 1992.

MELES ZENAWI

PRESIDENT OF THE TRANSITIONAL

GOVERNMENT OF ETHIOPIA

ብርሃንና ሰላም ማተሚያ ቤት ታተመ
BERHANENA SELAM PRINTING PRESS

ANNEX NO. 2

List of institutions and persons contacted during survey in Ethiopia

Local consultant

ITPA (International Trade Promotion Agency)
Eng. Assefa Makonnen - General Manager
P.O. Box 40501
Addis Ababa

ASPF

Mr. Getachew Dezefu - Acting general Manager
(General Manager, Mr. Asrat Sileshi, was abroad during the whole stay of the mission in Ethiopia)
Mr. Tesfaye Taminur - Technical Director
Mr. Jamal Ali - Financial Director
Mr. Mareska Volde Semayat - Sales and Marketing Director

UN - ECA

Mr. Louis Sangare - Director, Economic Cooperation
Mr. Mbaye Diouf - Senior Economist

Ministry of Foreign Trade

Mr. Gizachew Gebre Michael - Export Promotion Officer

Ethiopian Freight Transport Corporation (NATRACO)

Mr. Hagos Gebre Vold - Head, Planning Department

National Bank of Ethiopia

Head of Credit Department - wished to remain anonymous; asked that we refrain from disclosing his name and the source of information

ANNEX NO. 3

Main data of the countries in the region

Contents:

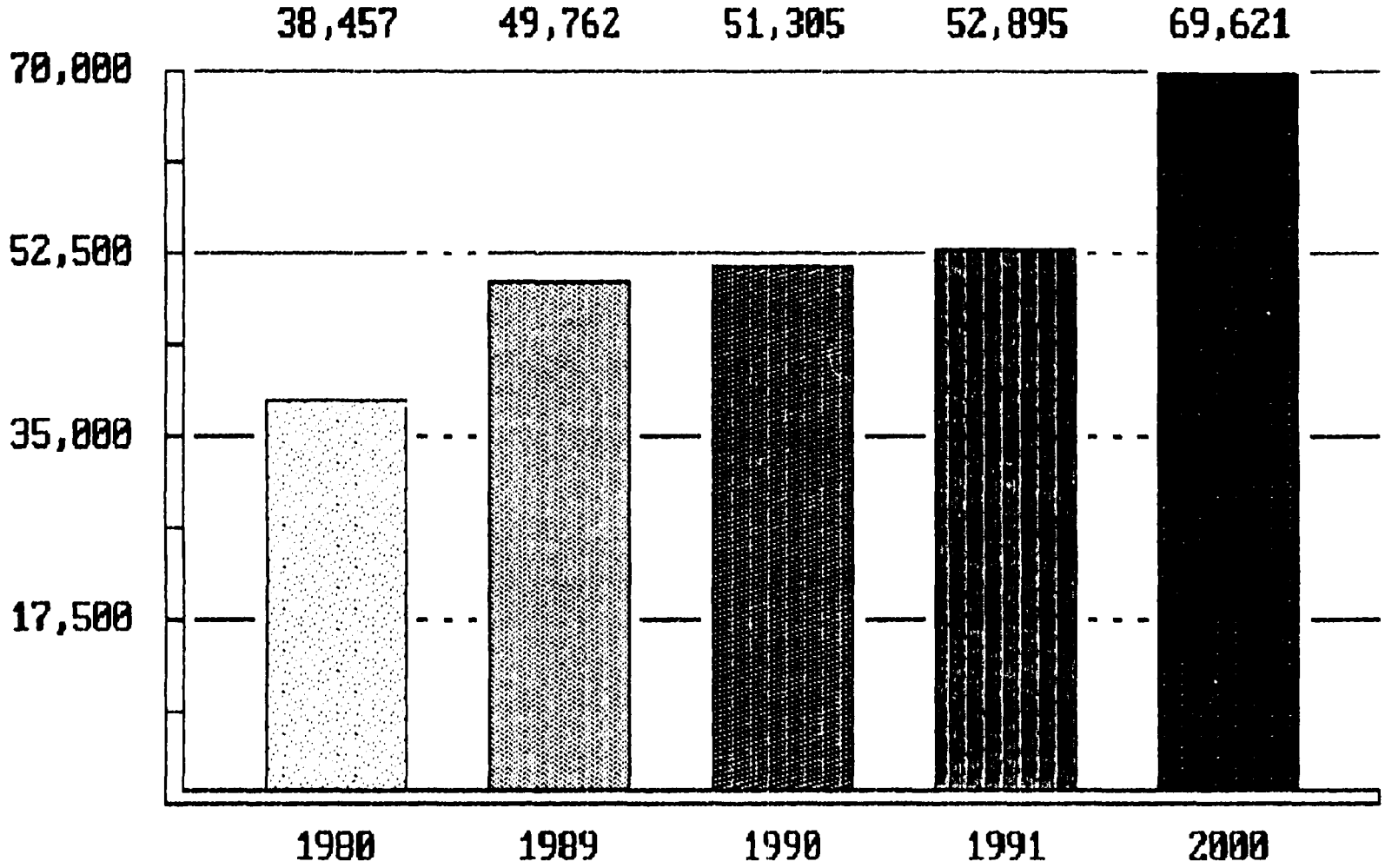
- resources, crops, industries
- principal import and export commodities

UGANDA

- population
- GNP
- industrial production
- agricultural production
- resources, crops, industries
- principal import and export commodities

ETHIOPIA

Population (in thousands)



- Annual Pop'n Growth: 3.1%
- Pop'n Doubling Time: 23 years
- Pop'n Density: 41 inhab./sq km
- Urbanization: 10.6%

ETHIOPIA

Agriculture (in metric tons)	
Barley (1988)	1,050,000
Coffee (1988)	180,000
Corn (1988)	1,650,000
Cotton (1988)	22,000
Eggs (1986)	77,000
Meat (1986)	303,000
Milk (1986)	600,000
Natural Rubber (1988)	0
Oats (1988)	20,000
Potatoes (1988)	230,000
Rice (1988)	0
Soybeans (1988)	6,000
Sugar (1988)	191,000
Tea (1988)	0
Tobacco (1988)	3,000
Wheat (1988)	825,000

NOTE: A value of 0 indicates no production reported.

ETHIOPIA

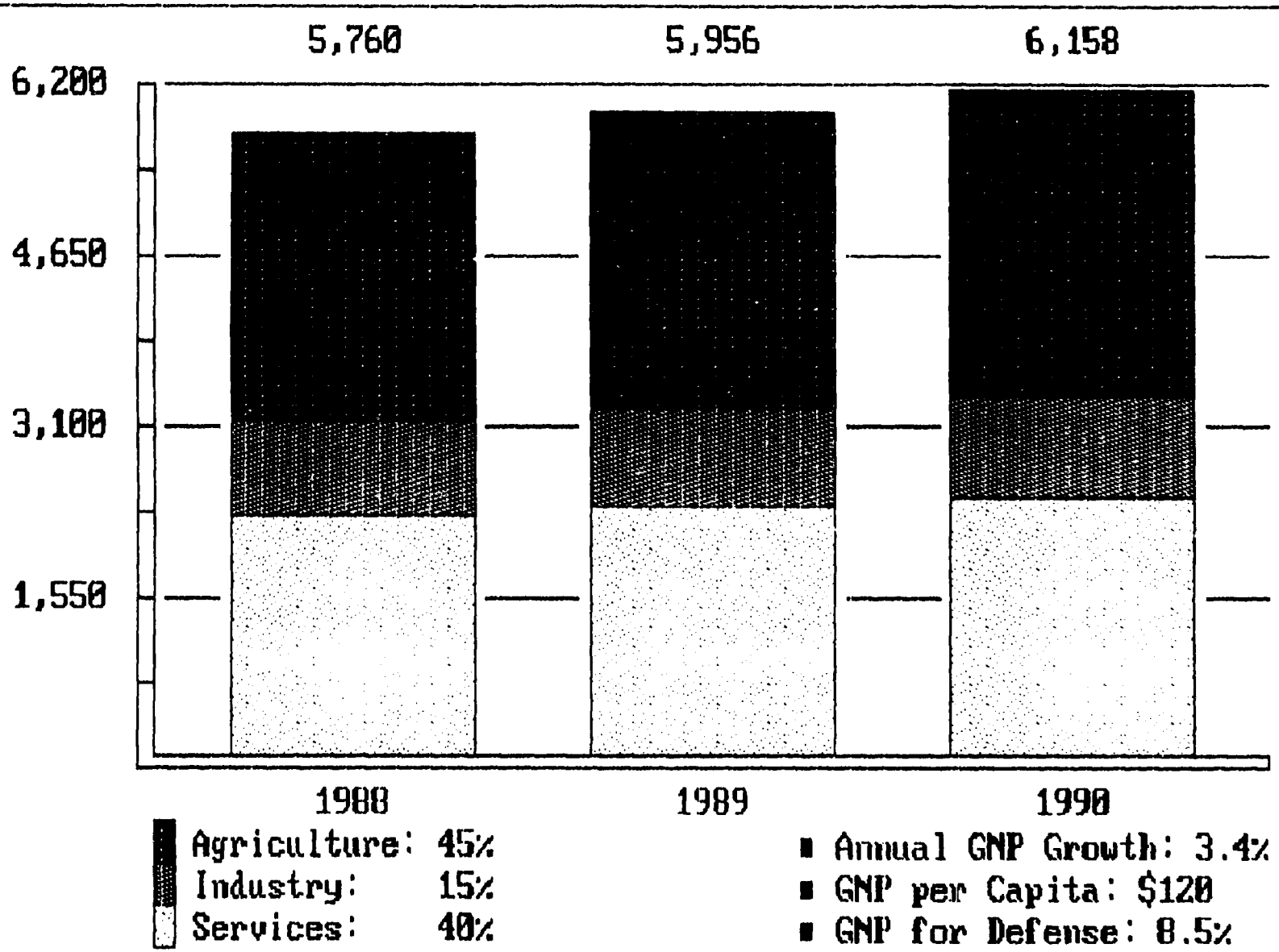
Manufacturing		
Beer (1986)	613,000	hl
Butter (1986)	9,000	m tons
Cement (1988)	160,000	m tons
Cheese (1986)	4,000	m tons
Cigarettes (1985)	1,250,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	0	m tons
Paper & Paperboard (1988)	10,000	m tons
Passenger Cars (1985)	0	
Radios (1986)	0	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

ETHIOPIA

Gross National Product (in millions of $US)



ETHIOPIA

Natural Resources	Agricultural Products	Major Industries
Potash	Sugarcane	Textiles
Salt	Corn	Foodstuffs
Gold	Sorghum	Beverages
Copper	Barley	Leather Goods
Platinum	Pulses	Footwear
Cement	Wheat	Metal Products
Limestone	Yams	Cigarettes
Fish	Potatoes	Chemicals
	Millet	Paper
	Coffee	Nonmetal. Mineral Prod.
	Cotton	Construction
	Oilseeds	Cement
	Hides & Skins	Hydroelectric Power
	Cattle	Petroleum Products
	Sheep	Printing
	Goats	
	Horses	

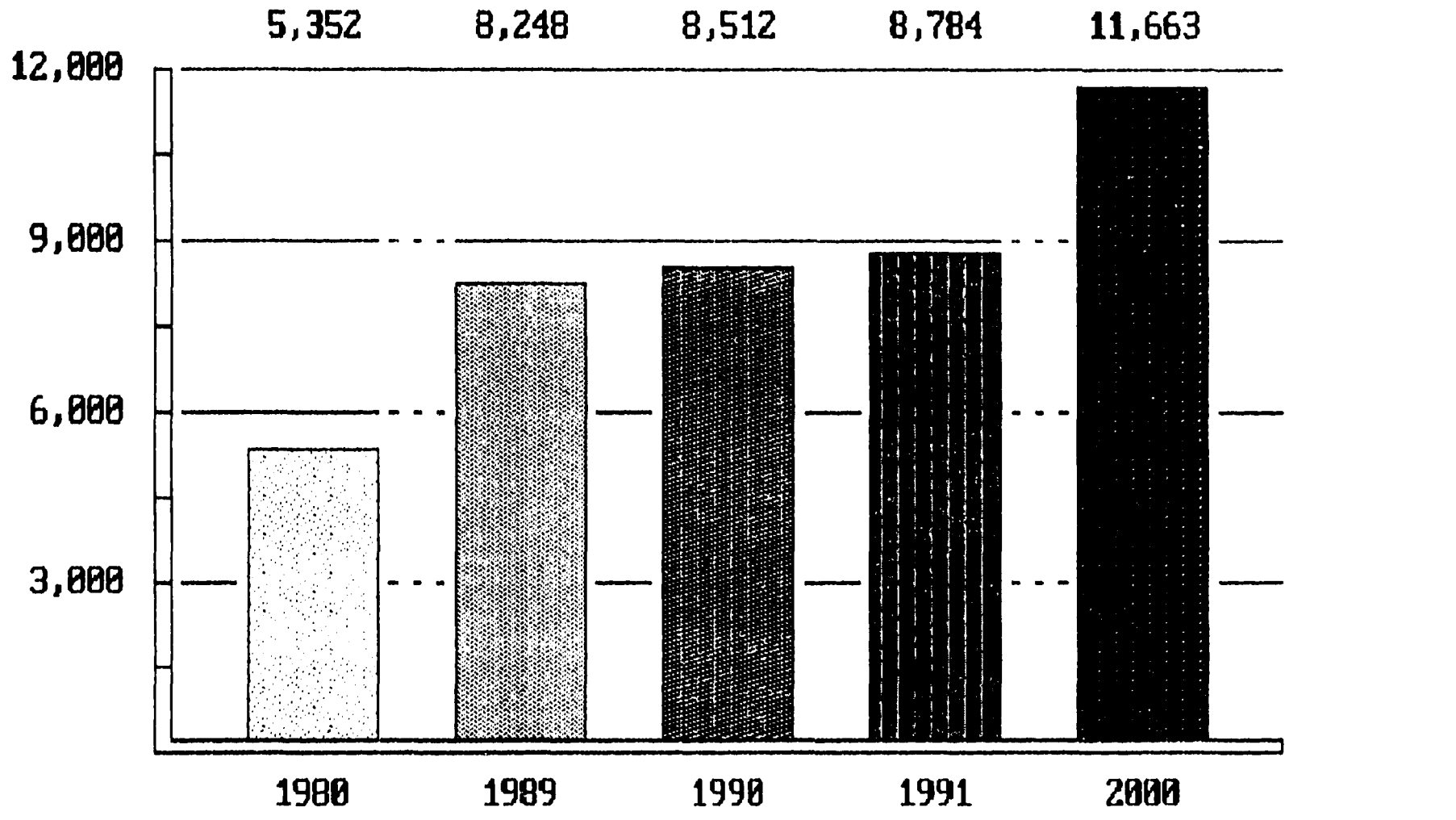
ETHIOPIA

Major Imports	Major Exports
Foodstuffs Beverages Vehicles Machinery Aircraft Petroleum Products Chemicals	Coffee Hides & Skins Livestock Pulses Oilseeds

- Balance of Trade (1986): -$327,000,000

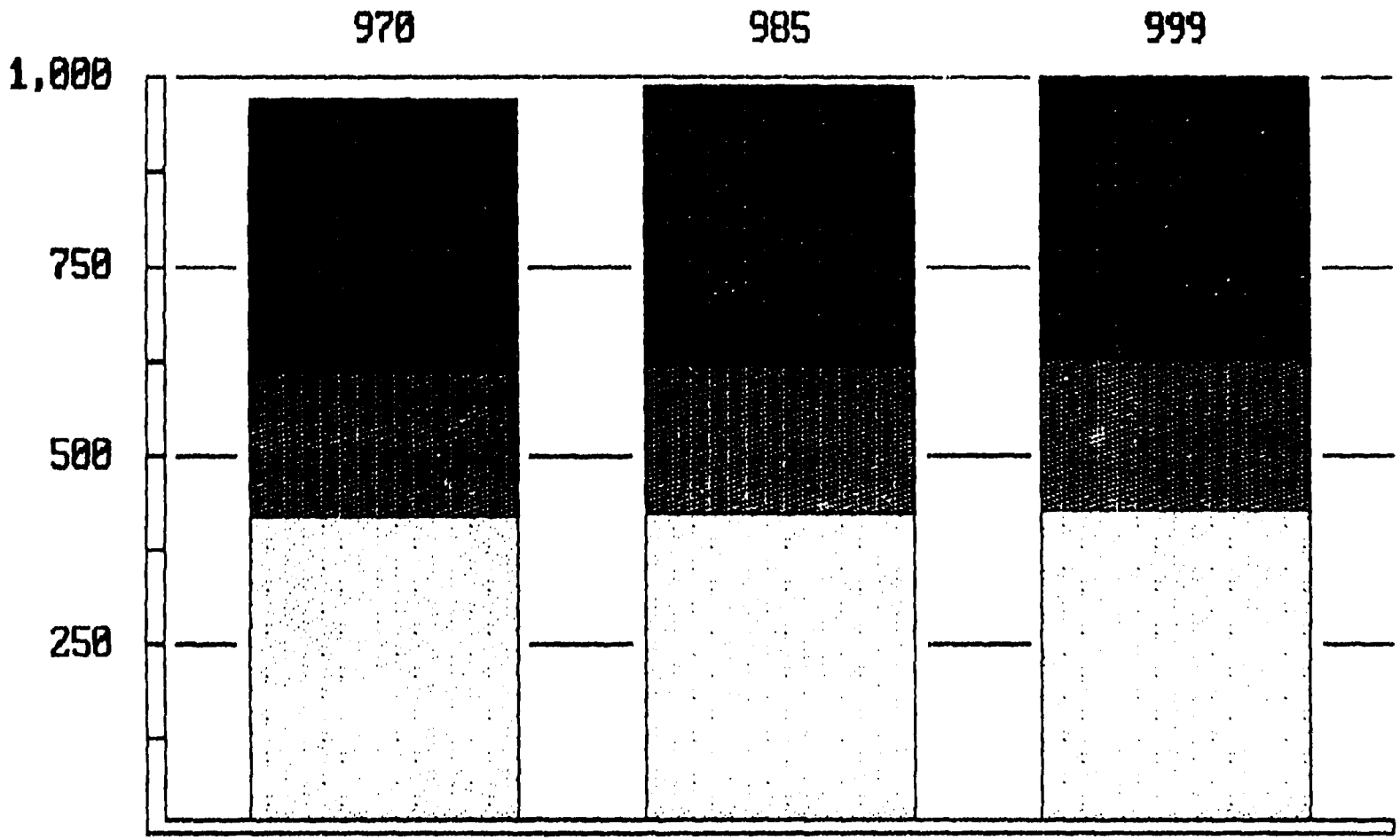
SOMALIA

Population (in thousands)



- Annual Pop'n Growth: 3.2%
- Pop'n Doubling Time: 22 years
- Pop'n Density: 13 inhab./sq km
- Urbanization: 32.5%

SOMALIA
Gross National Product (in millions of $US)



Agriculture: 37%
Industry: 20%
Services: 43%

- Annual GNP Growth: 1.5%
- GNP per Capita: $119
- GNP for Defense: 3.0%

Manufacturing		
Beer (1986)	0	hl
Butter (1986)	1,000	m tons
Cement (1988)	0	m tons
Cheese (1986)	0	m tons
Cigarettes (1985)	239,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	0	m tons
Paper & Paperboard (1988)	0	m tons
Passenger Cars (1985)	0	
Radios (1986)	0	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

SOMALIA

Agriculture (in metric tons)	
Barley (1988)	0
Coffee (1988)	0
Corn (1988)	282,000
Cotton (1988)	1,000
Eggs (1986)	3,000
Meat (1986)	57,000
Milk (1986)	147,000
Natural Rubber (1988)	0
Oats (1988)	0
Potatoes (1988)	0
Rice (1988)	12,000
Soybeans (1988)	0
Sugar (1988)	54,000
Tea (1988)	0
Tobacco (1988)	0
Wheat (1988)	0

NOTE: A value of 0 indicates no production reported.

SOMALIA

Natural Resources	Agricultural Products	Major Industries
Uranium	Sugarcane	Foodstuffs
Iron Ore	Corn	Paper
Tin	Sorghum	Beverages
Gypsum	Bananas	Tobacco
Bauxite	Vegetables	Textiles
Copper	Sesame	Clothing
Salt	Roots & Tubers	Footwear
Fish	Citrus Fruits	Petroleum Products
	Beans	Metal Products
	Rice	Sugar
	Dates	Printing
	Cotton	
	Groundnuts	
	Goats	
	Sheep	
	Camels	
	Cattle	

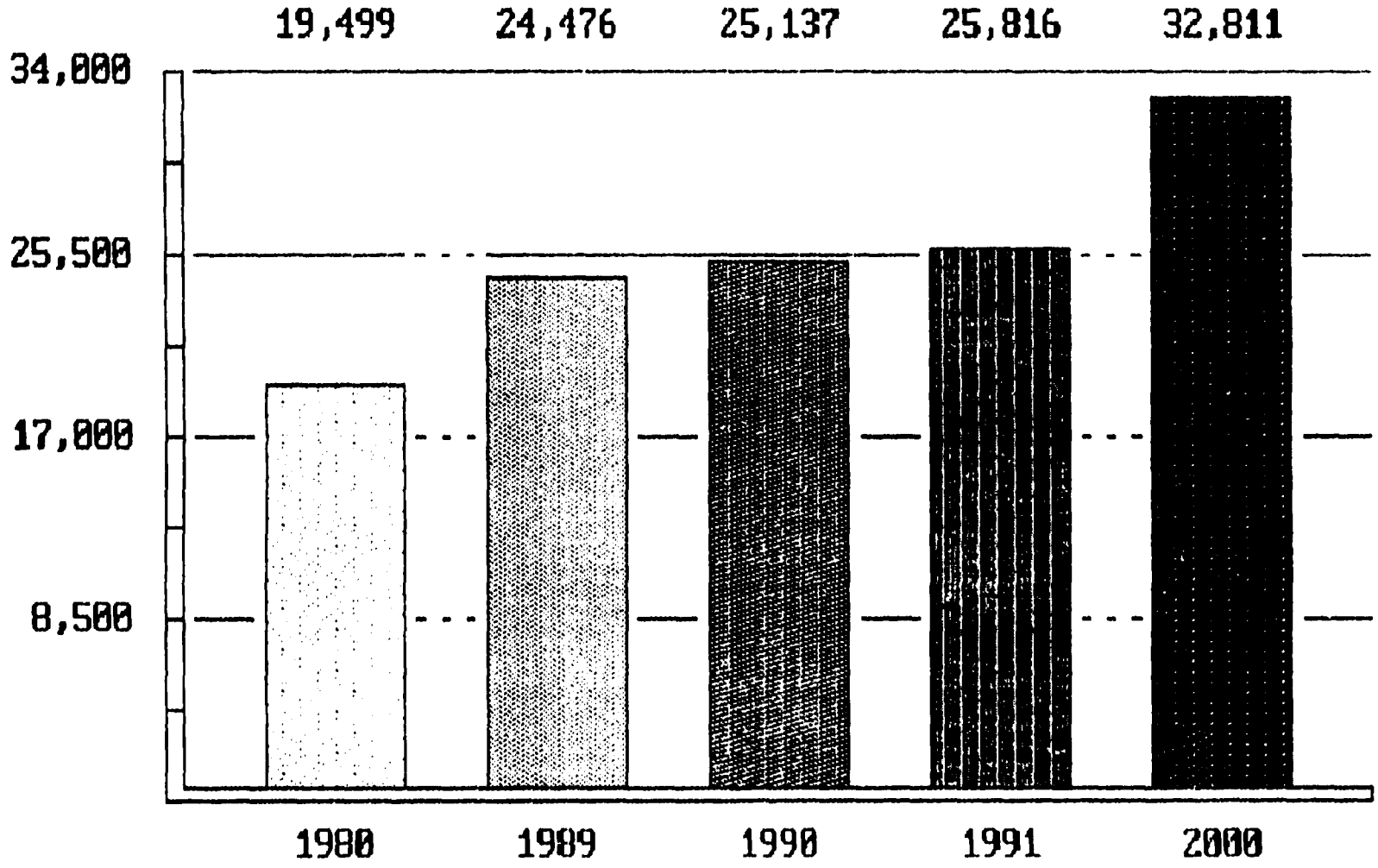
SOMALIA

Major Imports	Major Exports
Foodstuffs Machinery Vehicles Electrical Products Building Materials Fuels Raw Materials Beverages Tobacco Chemicals Clothing Footwear Textiles Cereals	Livestock Bananas Hides & Skins Furs Fish

- Balance of Trade (1987): -$100,000,000

SUDAN

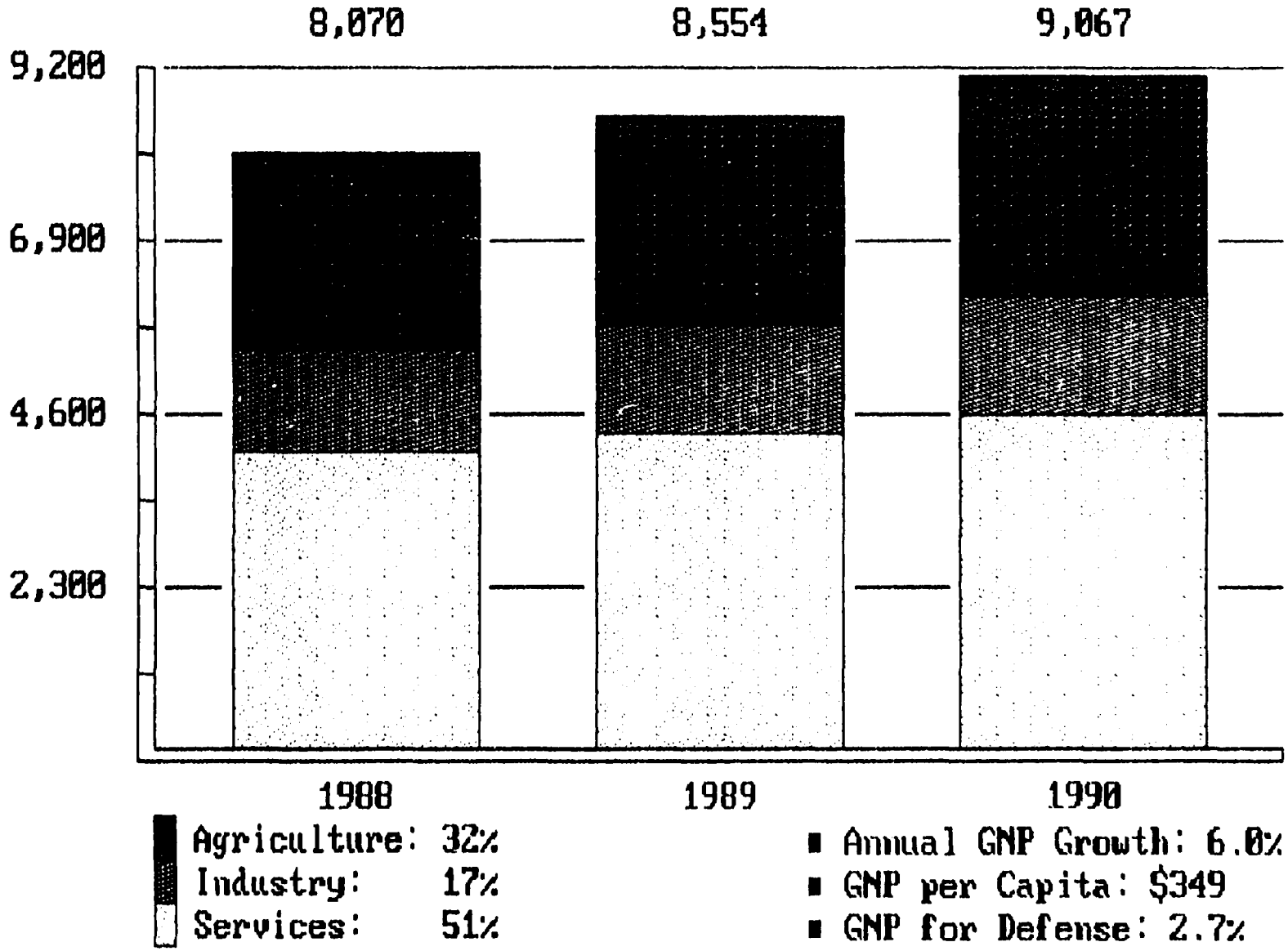
Population (in thousands)



- Annual Pop'n Growth: 2.7%
- Pop'n Doubling Time: 26 years
- Pop'n Density: 10 inhab./sq km
- Urbanization: 20.2%

SUDAN

Gross National Product (in millions of $US)



Manufacturing		
Beer (1986)	11,000	hl
Butter (1986)	13,000	m tons
Cement (1988)	199,000	m tons
Cheese (1986)	59,000	m tons
Cigarettes (1985)	1,700,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	0	m tons
Paper & Paperboard (1988)	9,000	m tons
Passenger Cars (1985)	0	
Radios (1986)	0	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

SUDAN

Agriculture (in metric tons)	
Barley (1988)	0
Coffee (1988)	0
Corn (1988)	30,000
Cotton (1988)	130,000
Eggs (1986)	41,000
Meat (1986)	433,000
Milk (1986)	1,750,000
Natural Rubber (1988)	0
Oats (1988)	0
Potatoes (1988)	23,000
Rice (1988)	8,000
Soybeans (1988)	0
Sugar (1988)	472,000
Tea (1988)	0
Tobacco (1988)	0
Wheat (1988)	199,000

NOTE: A value of 0 indicates no production reported.

SUDAN

Natural Resources	Agricultural Products	Major Industries
Petroleum	Sorghum	Sugar
Iron Ore	Sugarcane	Wheat
Copper	Millet	Flour
Chromite	Groundnuts	Cement
Zinc	Cotton	Plastics
Tungsten	Sesame	Yarn
Mica	Yams	Perfumes
Silver	Cassava	Textiles
Salt	Wheat	Footwear
Gypsum	Gum Arabic	Cigarettes
Anhydrite	Barley	Tires
Fish	Cattle	
	Sheep	
	Goats	
	Camels	
	Roundwood	

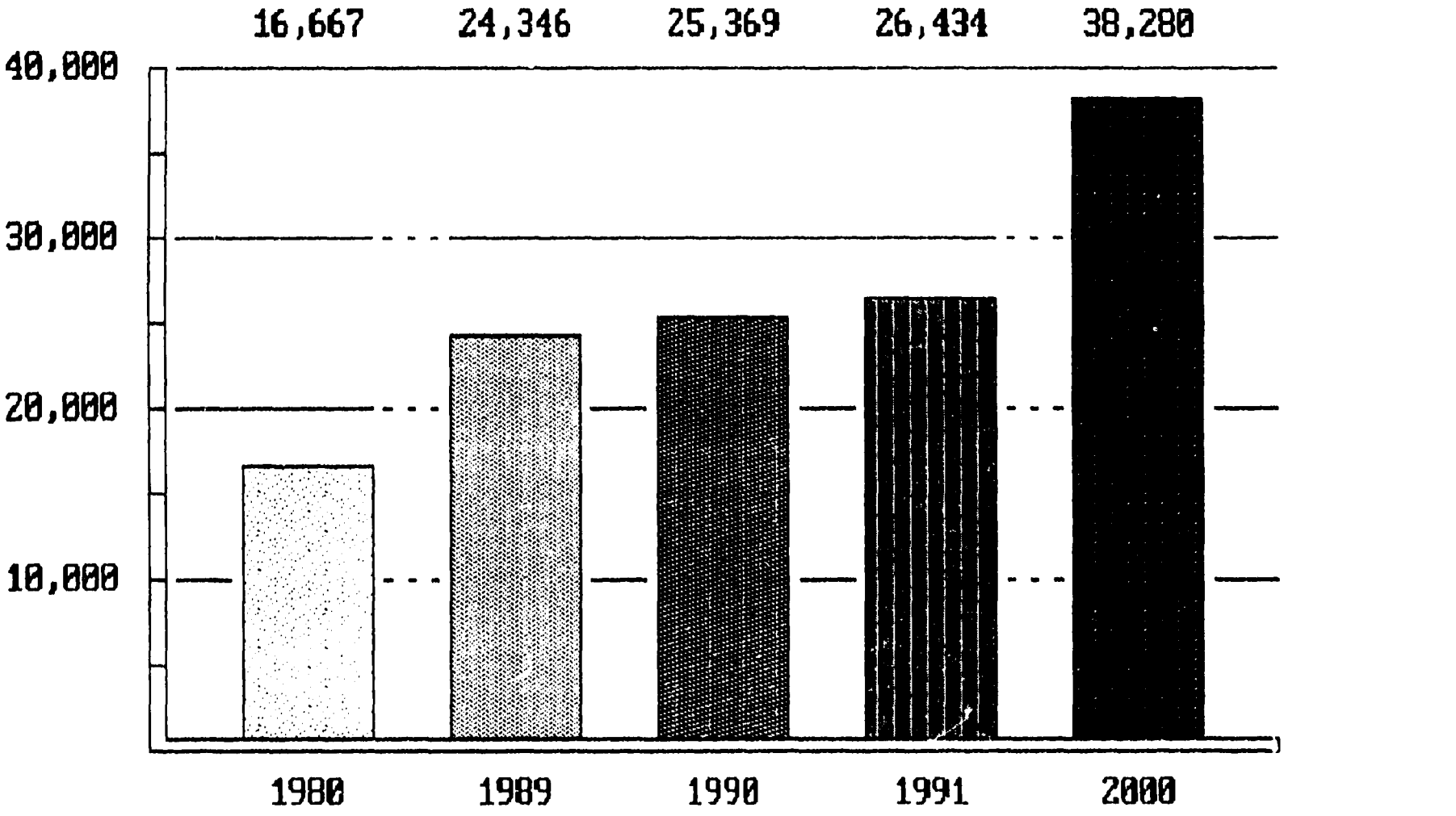
SUDAN

Major Imports	Major Exports
Machinery Vehicles Manufactured Goods Petroleum Products Foodstuffs Tobacco Chemicals Textiles	Cotton Sorghum Peanuts Sesame Seeds Sheep & Lambs

- Balance of Trade (1988): -$323,000,000

KENYA

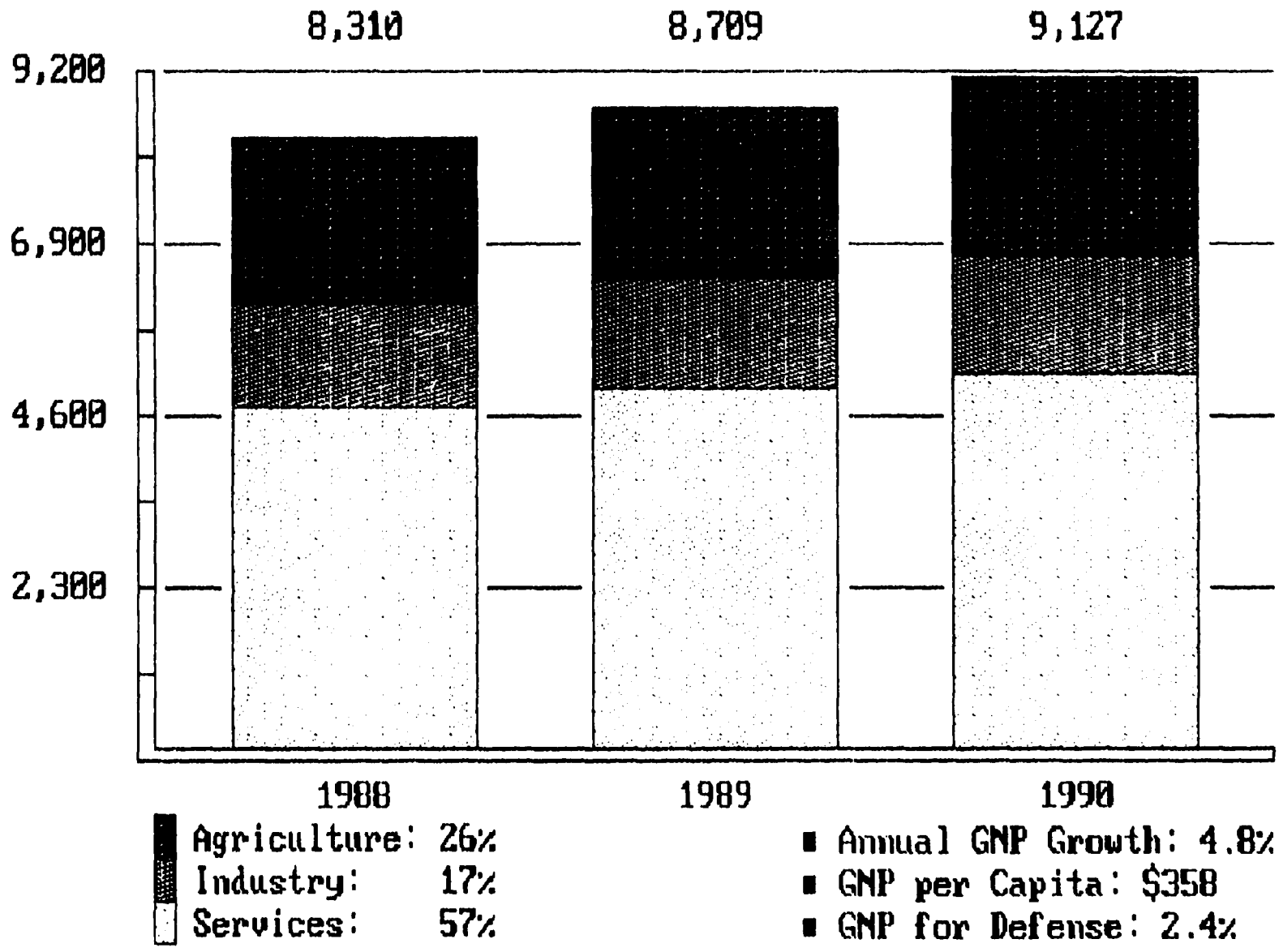
Population (in thousands)



- Annual Pop'n Growth: 4.2%
- Pop'n Doubling Time: 17 years
- Pop'n Density: 42 inhab./sq km
- Urbanization: 19.7%

KENYA

Gross National Product (in millions of $US)



KENYA

Manufacturing		
Beer (1986)	2,926,000	hl
Butter (1986)	3,000	m tons
Cement (1988)	1,178,000	m tons
Cheese (1986)	0	m tons
Cigarettes (1985)	5,661,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	8,000	m tons
Paper & Paperboard (1988)	98,000	m tons
Passenger Cars (1985)	0	
Radios (1986)	0	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

KENYA

Agriculture (in metric tons)	
Barley (1988)	15,000
Coffee (1988)	109,000
Corn (1988)	1,900,000
Cotton (1988)	24,000
Eggs (1986)	33,000
Meat (1986)	174,000
Milk (1986)	901,000
Natural Rubber (1988)	0
Oats (1988)	6,000
Potatoes (1988)	730,000
Rice (1988)	54,000
Soybeans (1988)	0
Sugar (1988)	369,000
Tea (1988)	160,000
Tobacco (1988)	9,000
Wheat (1988)	185,000

NOTE: A value of 0 indicates no production reported.

KENYA

Natural Resources	Agricultural Products	Major Industries
Gold	Sugarcane	Cement
Limestone	Corn	Sugar
Diatomite	Potatoes	Flour
Salt	Cassava	Soap
Magnesite	Pulses	Fabrics
Feldspar	Sweet Potatoes	Beer
Gems	Plantains	Mineral Water
Wildlife	Pineapples	Paints
Soda Ash	Wheat	Alcoholic Beverages
Salt	Tea	Meat Products
Fluorspar	Bananas	Hides & Skins
Corundum	Sorghum	Petroleum Products
Fish	Coffee	Light Manufacturing
	Coconuts	Foodstuffs
	Millet	Tourism
	Sisal	
	Cotton	

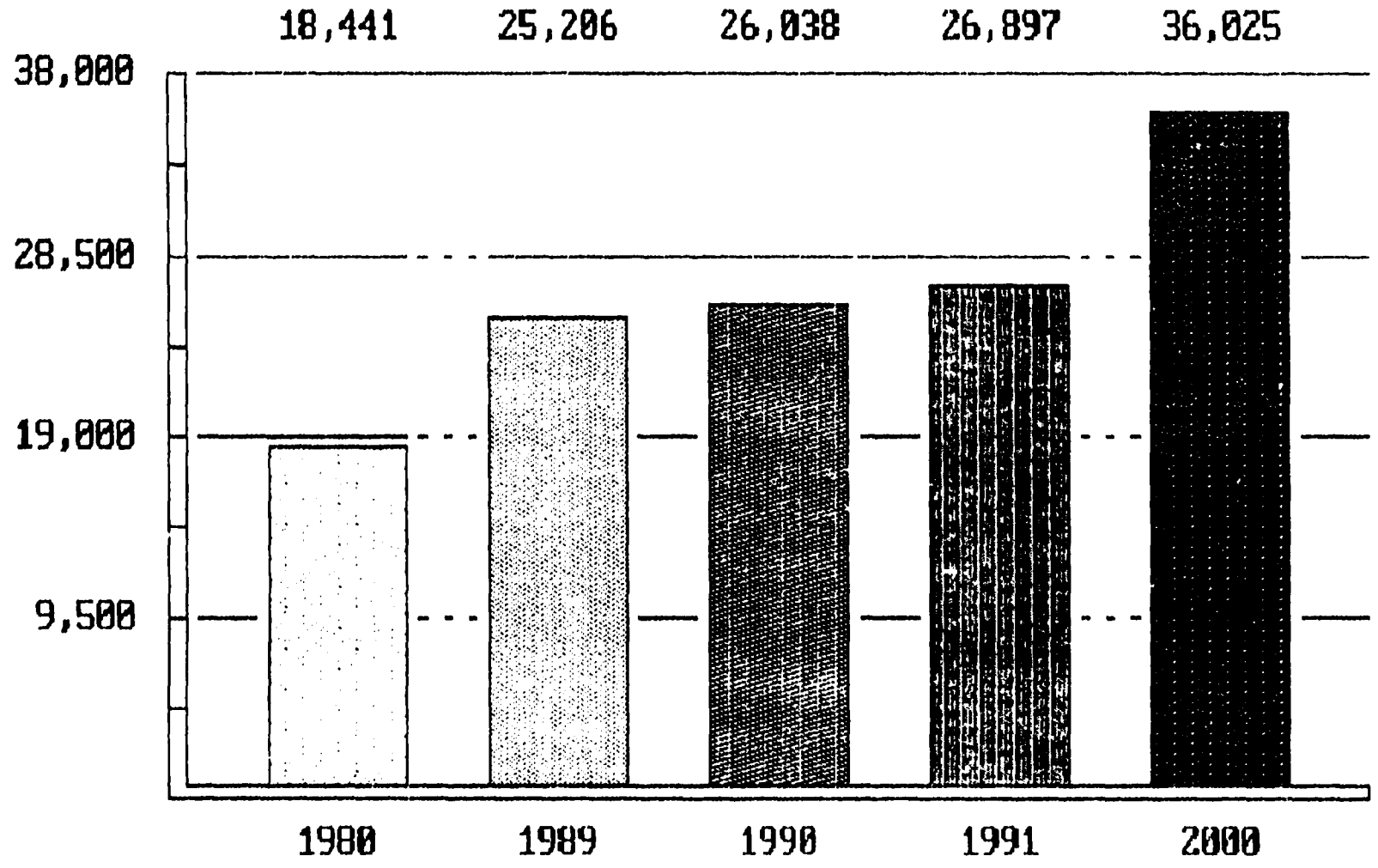
KENYA

Major Imports	Major Exports
Machinery	Coffee
Vehicles	Tea
Petroleum	Petroleum Products
Chemicals	Vegetables
Manufactured Goods	Fruits
Foodstuffs	Corn
Livestock	Hides & Skins
Fertilizers	Animal Products
Paper Products	Cement
Iron & Steel	Sisal
Pharmaceuticals	Pyrethrum
Textiles	Pineapples

- Balance of Trade (1987): -$491,000,000

TANZANIA

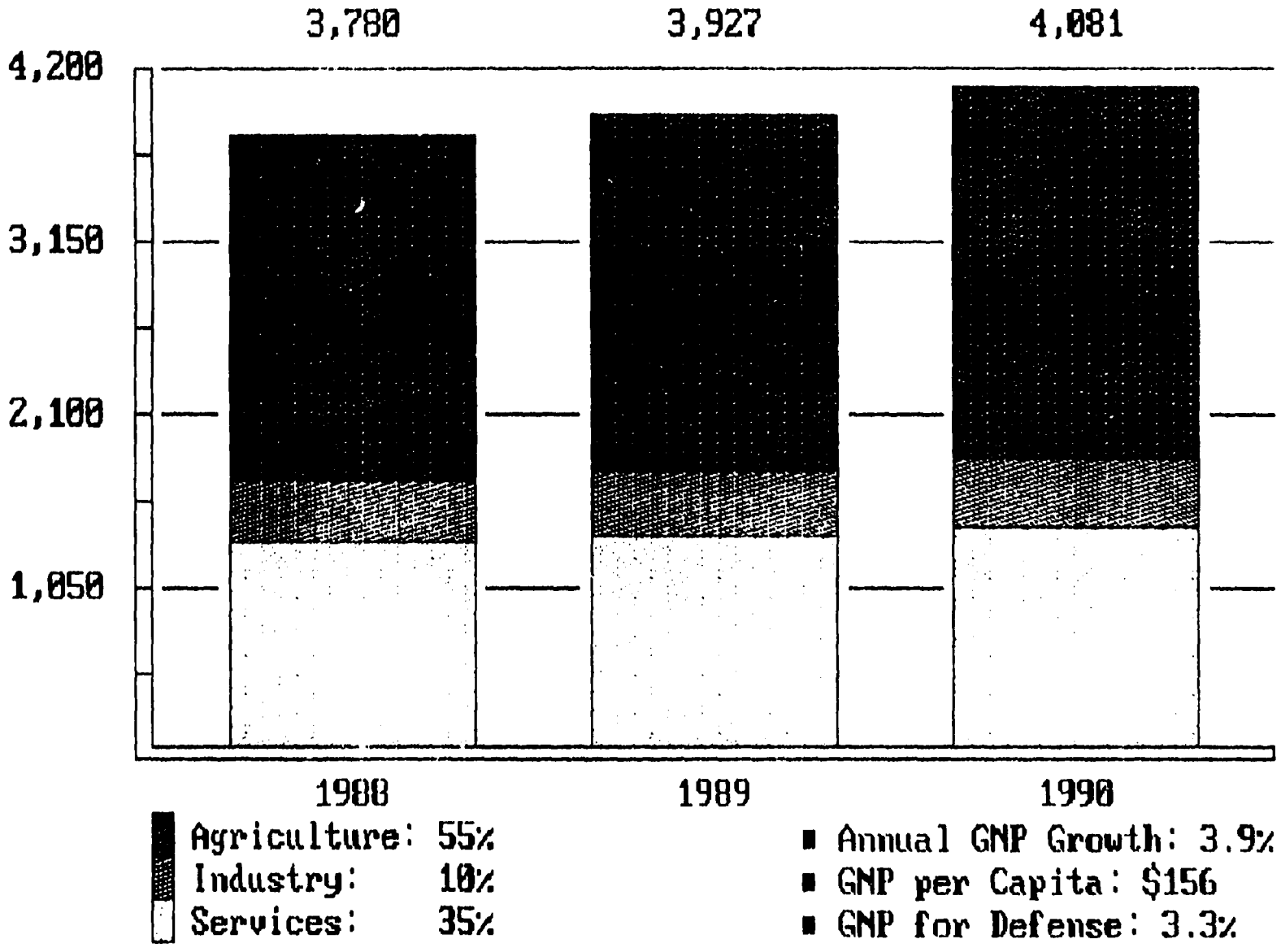
Population (in thousands)



- Annual Pop'n Growth: 3.3%
- Pop'n Doubling Time: 21 years
- Pop'n Density: 27 inhab./sq km
- Urbanization: 19.0%

TANZANIA

Gross National Product (in millions of $US)



TANZANIA

Manufacturing

Beer (1986)	642,000	hl
Butter (1986)	4,000	m tons
Cement (1988)	410,000	m tons
Cheese (1986)	0	m tons
Cigarettes (1985)	4,050,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	0	m tons
Paper & Paperboard (1988)	0	m tons
Passenger Cars (1985)	0	
Radios (1986)	223,000	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

TANZANIA

Agriculture (in metric tons)	
Barley (1988)	0
Coffee (1988)	49,000
Corn (1988)	2,339,000
Cotton (1988)	159,000
Eggs (1986)	58,000
Meat (1986)	173,000
Milk (1986)	432,000
Natural Rubber (1988)	0
Oats (1988)	0
Potatoes (1988)	230,000
Rice (1988)	628,000
Soybeans (1988)	0
Sugar (1988)	105,000
Tea (1988)	15,000
Tobacco (1988)	12,000
Wheat (1988)	72,000

NOTE: A value of 0 indicates no production reported.

TANZANIA

Natural Resources	Agricultural Products	Major Industries
Hydroelectric Power	Cassava	Cement
Tin	Corn	Meat Products
Phosphates	Bananas	Fertilizer
Iron Ore	Plantains	Iron Products
Coal	Sugarcane	Hides & Skins
Gems	Rice	Aluminum
Gold	Sorghum	Textiles
Natural Gas	Coconuts	Lumber Products
Nickel	Sweet Potatoes	Footwear
Fish	Millet	Foodstuffs
	Cotton	Light Manufacturing
	Dry Beans	Petroleum Products
	Potatoes	Beer
	Mangoes	
	Groundnuts	
	Cashews	
	Cloves	

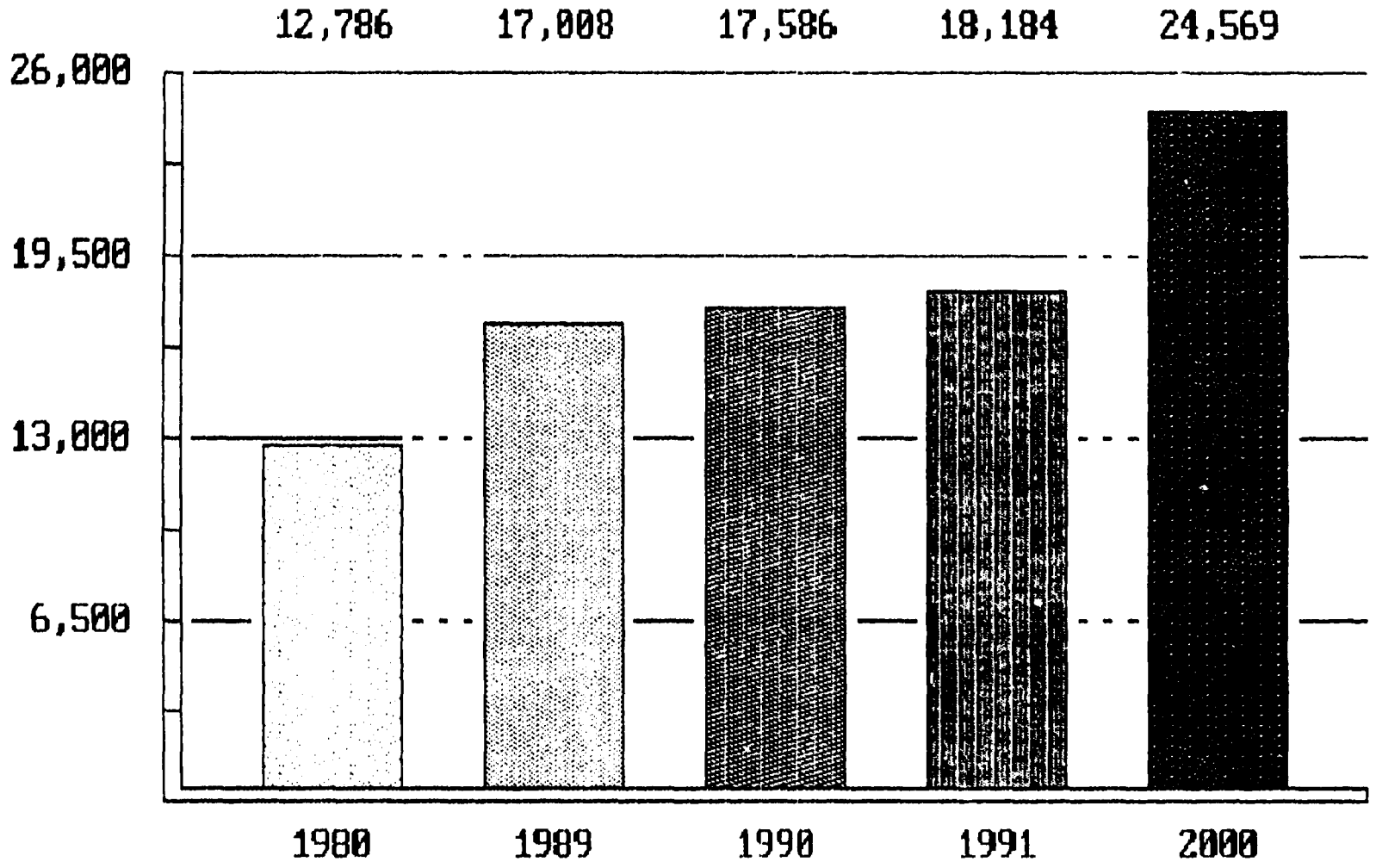
TANZANIA

Major Imports	Major Exports
Machinery Vehicles Industrial Goods Consumer Goods Building Materials Fuels Metals Chemicals	Coffee Cotton Sisal Cashews Meat Tea Cloves Tobacco

- Balance of Trade (1988): -$258,000,000

UGANDA

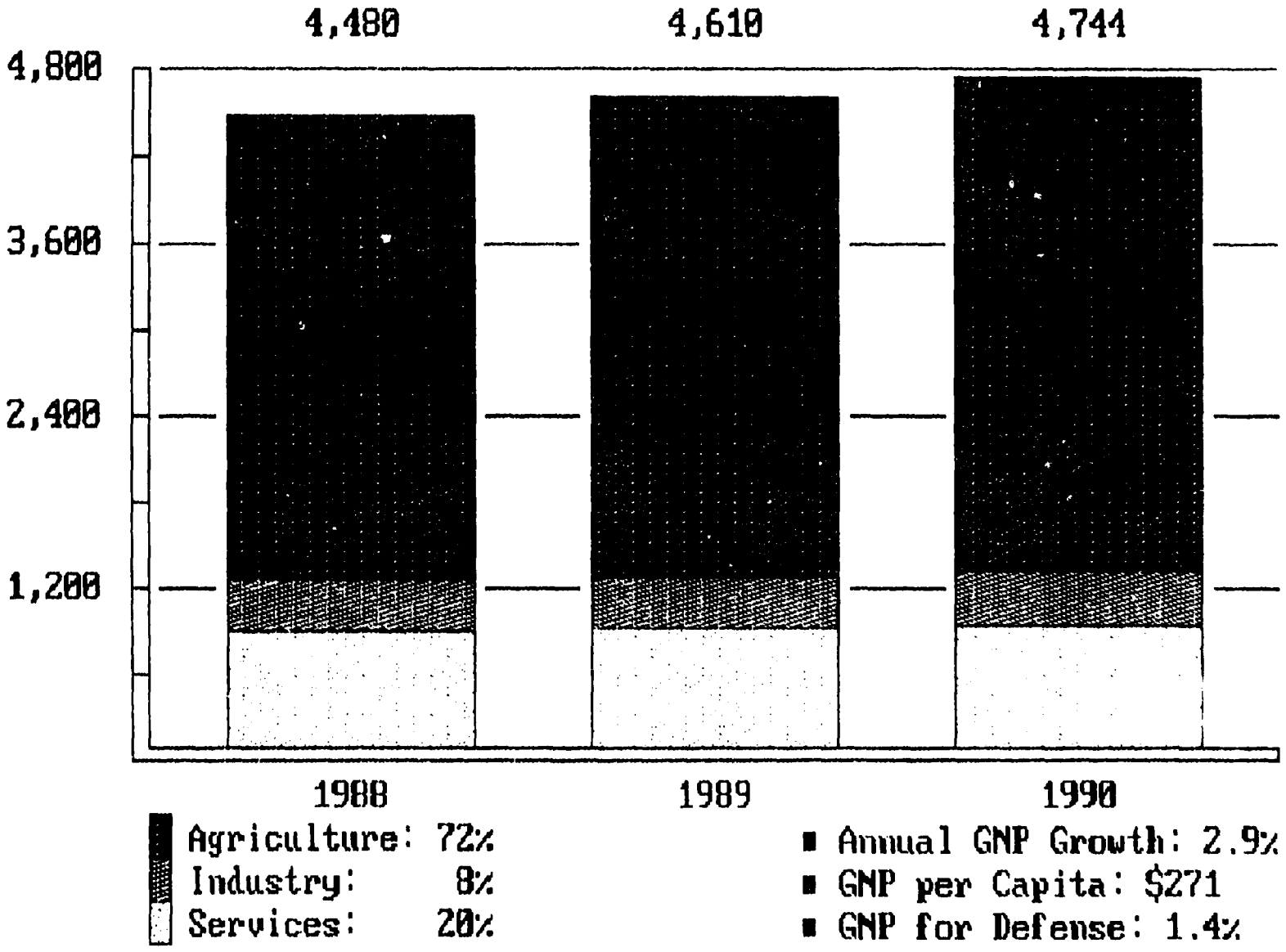
Population (in thousands)



- Annual Pop'n Growth: 3.4%
- Pop'n Doubling Time: 21 years
- Pop'n Density: 72 inhab./sq km
- Urbanization: 9.4%

UGANDA

Gross National Product (in millions of $US)



Manufacturing		
Beer (1986)	215,000	hl
Butter (1986)	0	m tons
Cement (1988)	15,000	m tons
Cheese (1986)	0	m tons
Cigarettes (1985)	1,638,000,000	
Merchant Vessels (1986)	0	grt
Newsprint (1988)	0	m tons
Paper & Paperboard (1988)	2,000	m tons
Passenger Cars (1985)	0	
Radios (1986)	0	
Televisions (1986)	0	
Wine (1987)	0	hl
Wool (1986)	0	m tons

hl = hectoliters grt = gross registered tons

NOTE: A value of 0 indicates no production reported.

UGANDA

Agriculture (in metric tons)	
Barley (1988)	0
Coffee (1988)	205,000
Corn (1988)	357,000
Cotton (1988)	8,000
Eggs (1986)	18,000
Meat (1986)	107,000
Milk (1986)	364,000
Natural Rubber (1988)	0
Oats (1988)	0
Potatoes (1988)	340,000
Rice (1988)	22,000
Soybeans (1988)	10,000
Sugar (1988)	40,000
Tea (1988)	4,000
Tobacco (1988)	3,000
Wheat (1988)	28,000

NOTE: A value of 0 indicates no production reported.

UGANDA

Natural Resources	Agricultural Products	Major Industries
Copper	Bananas	Meat Products
Cobalt	Plantains	Sugar
Limestone	Cassava	Animal Feed
Salt	Sweet Potatoes	Metal Products
Tungsten	Sugarcane	Footwear
Fish	Pulses	Cigarettes
	Millet	Beer
	Dry Beans	Foodstuffs
	Corn	Consumer Goods
	Sorghum	Textiles
	Coffee	
	Peanuts	
	Tea	
	Tobacco	
	Cotton	
	Cattle	
	Goats	

UGANDA

Major Imports	Major Exports
Sugar Vehicles Textiles & Clothing Building Materials Foodstuffs	Coffee Cotton Tea

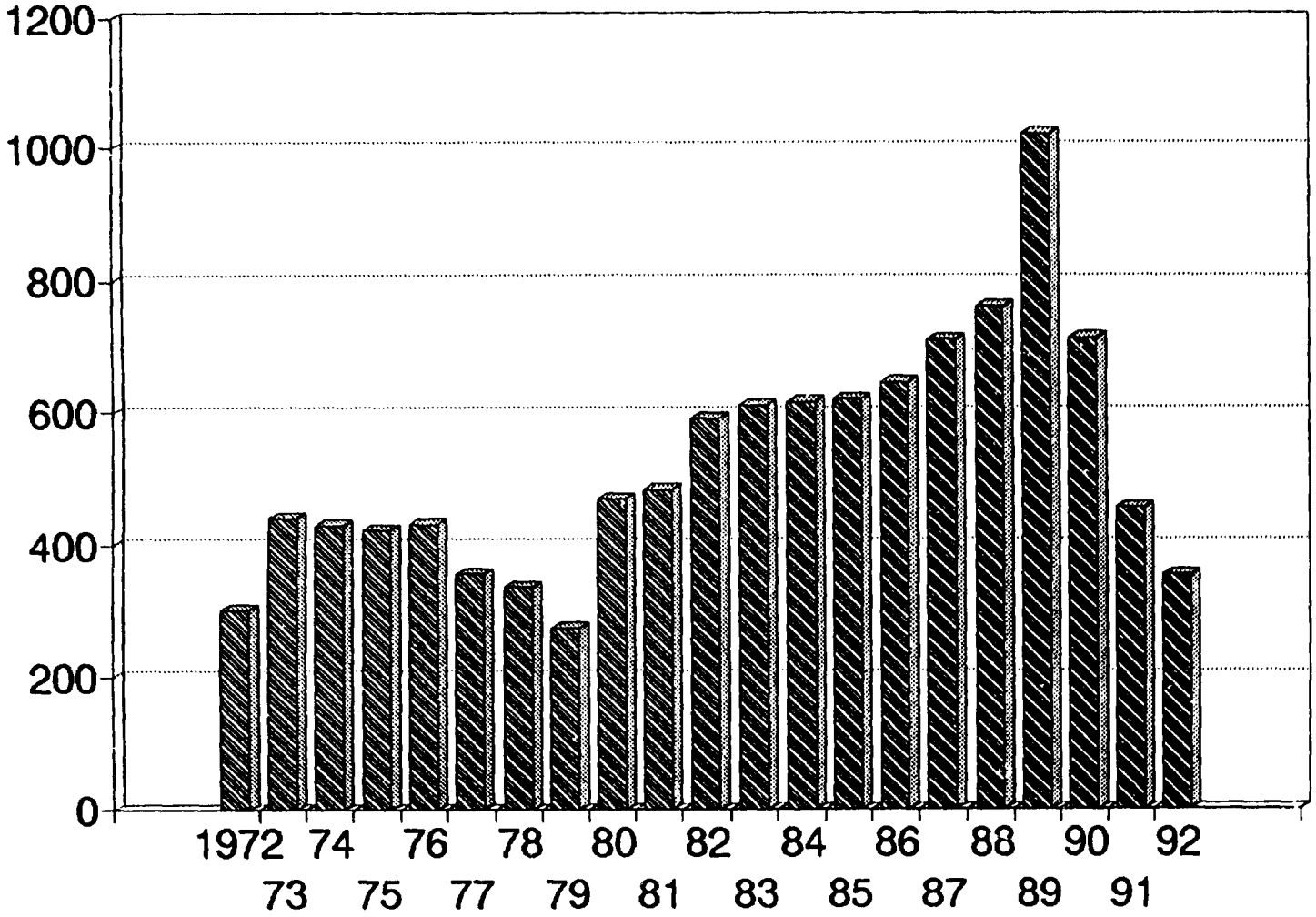
- Balance of Trade (1988): -$194,000,000

ANNEX NO. 4

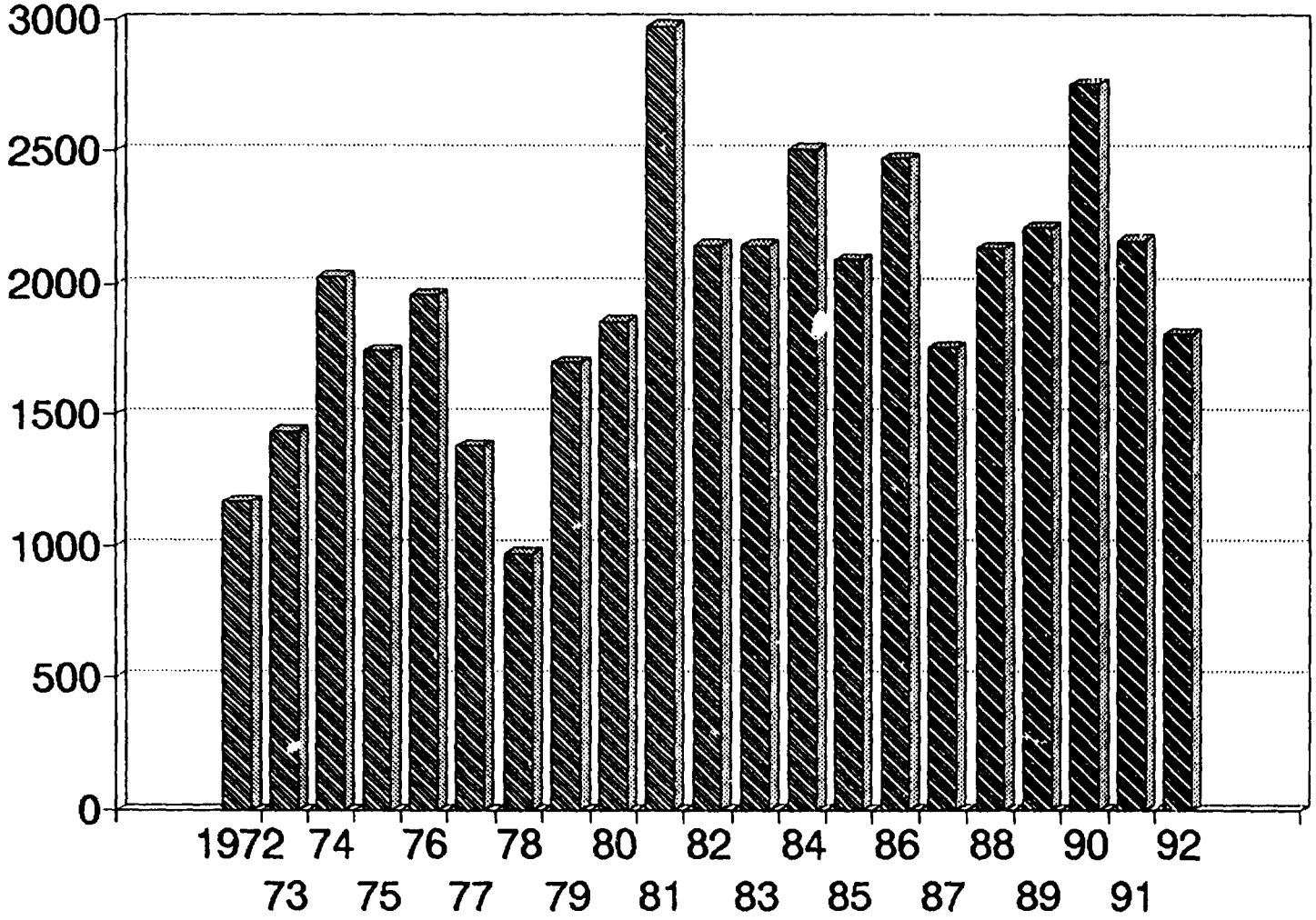
Graphs showing the automobile market situation

Contents:

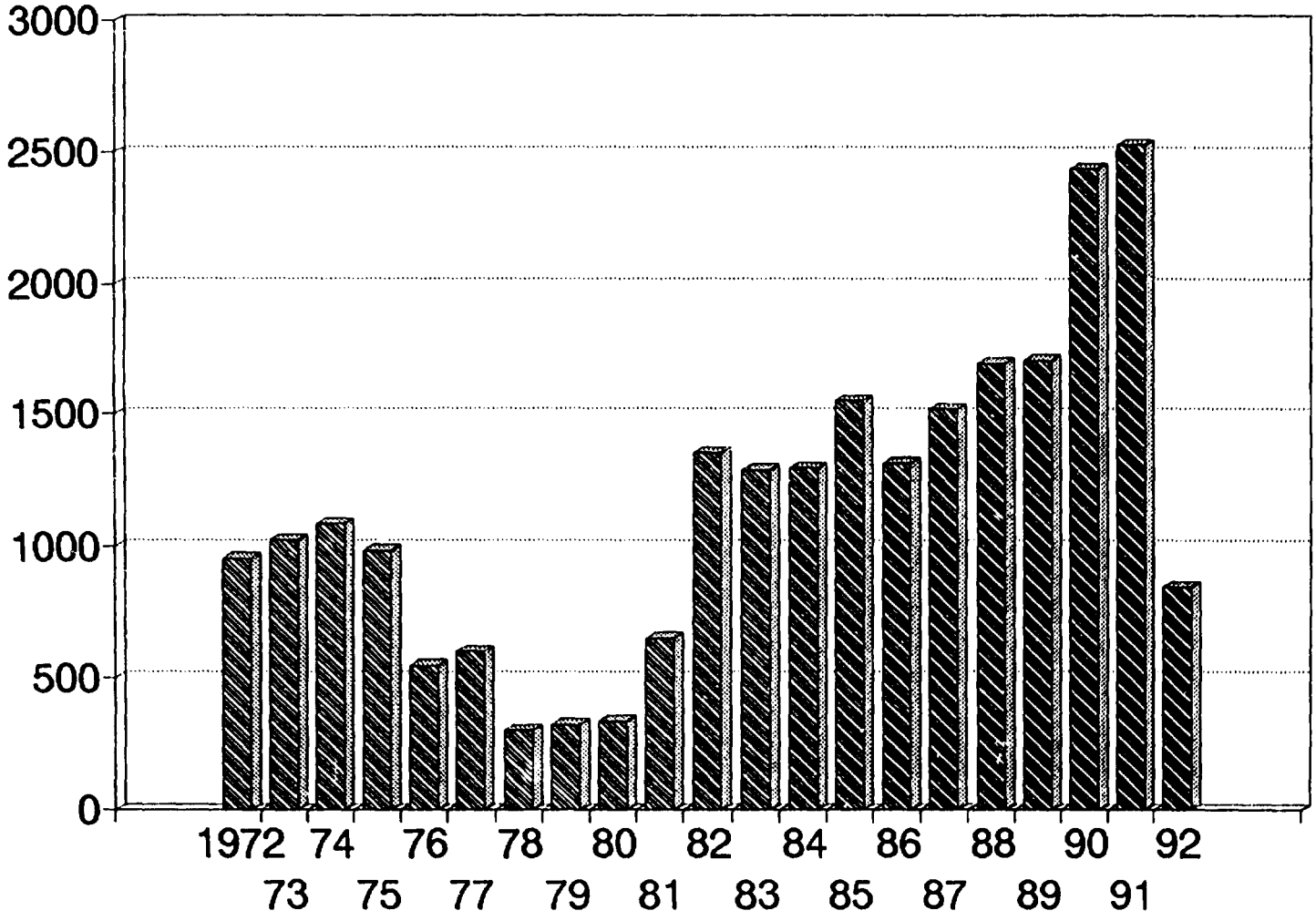
Tanker Registrations 1972-1992



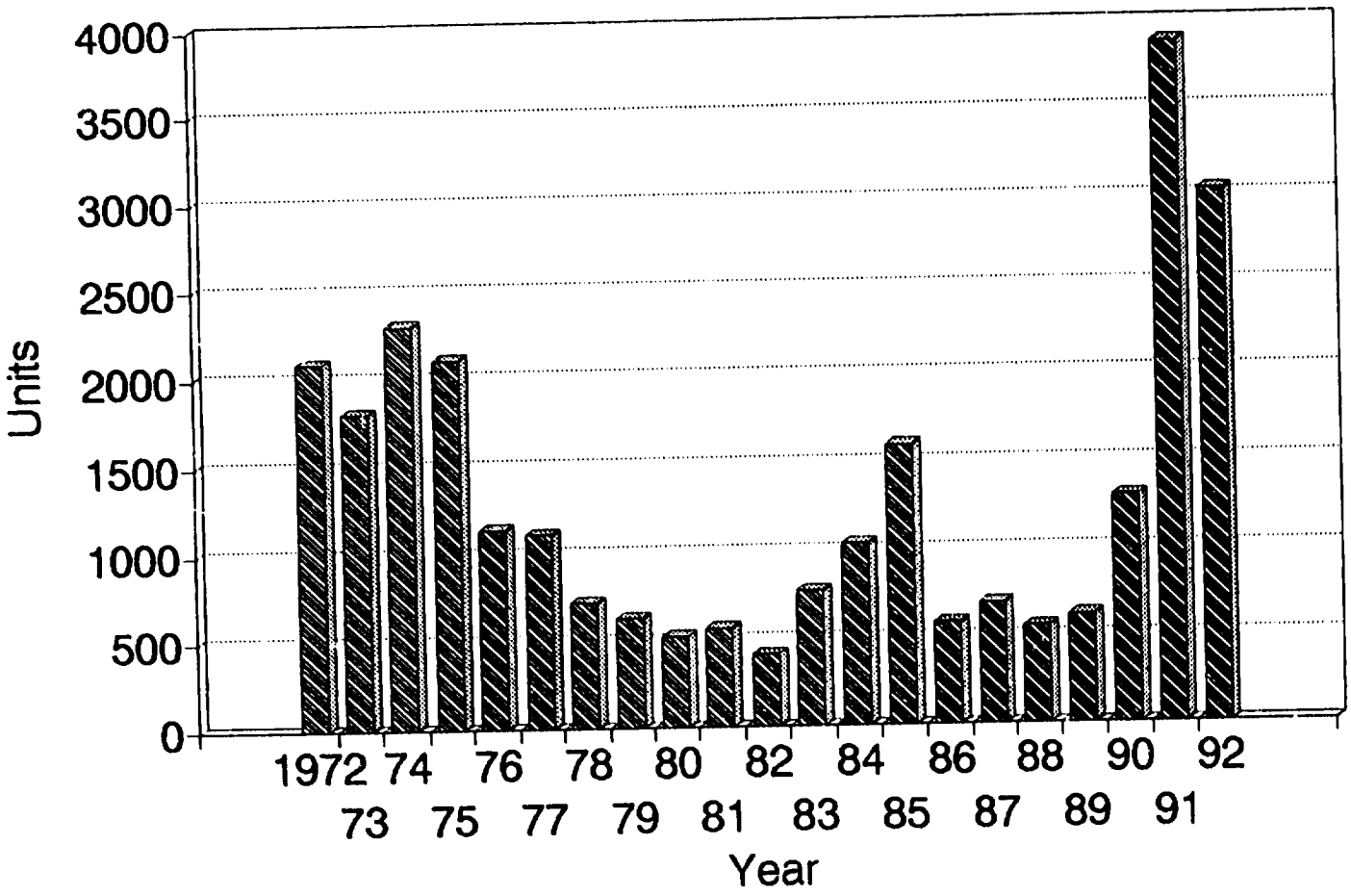
Trailer Registrations (1972-1992)



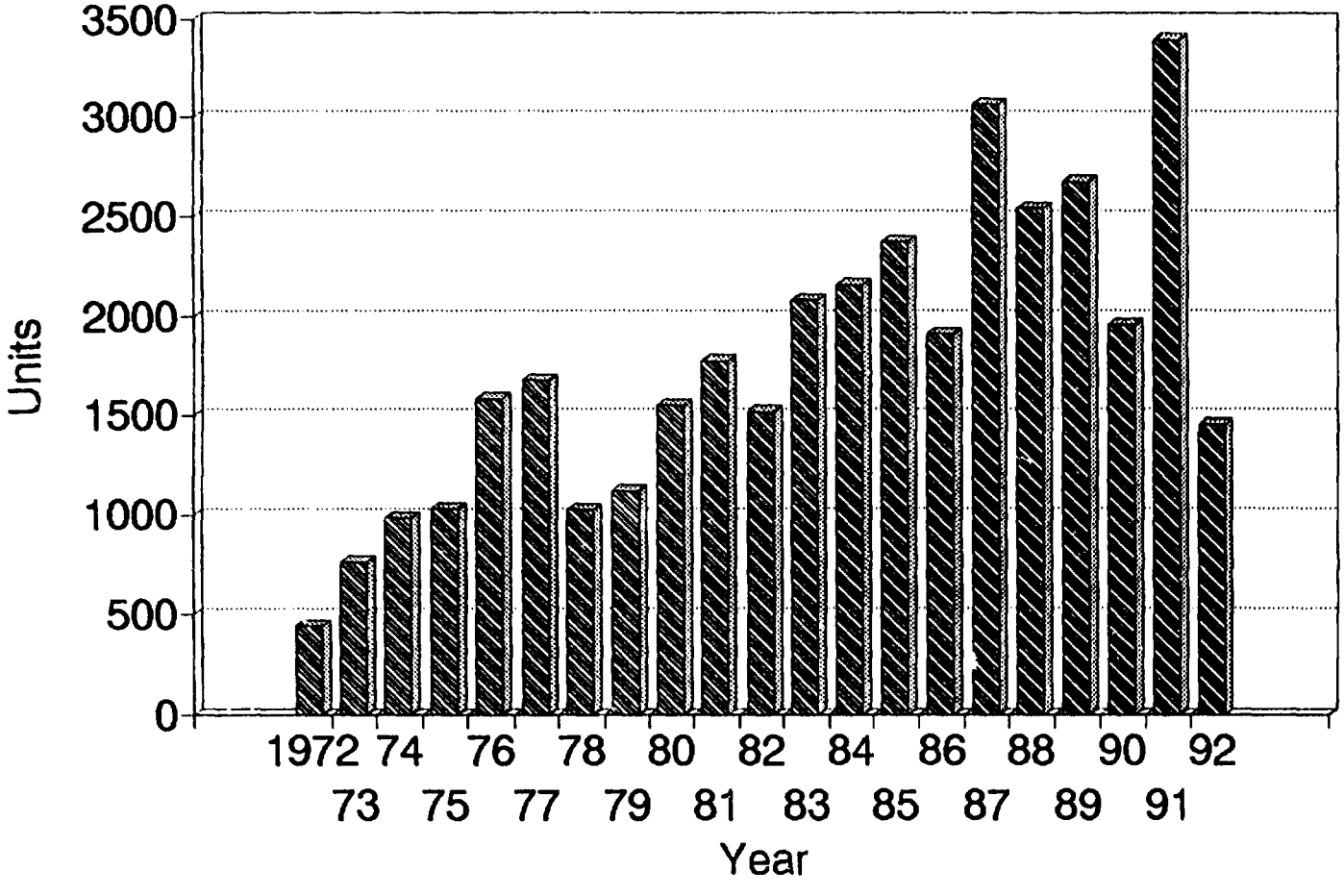
Motorcycle Registrations 1972-1992



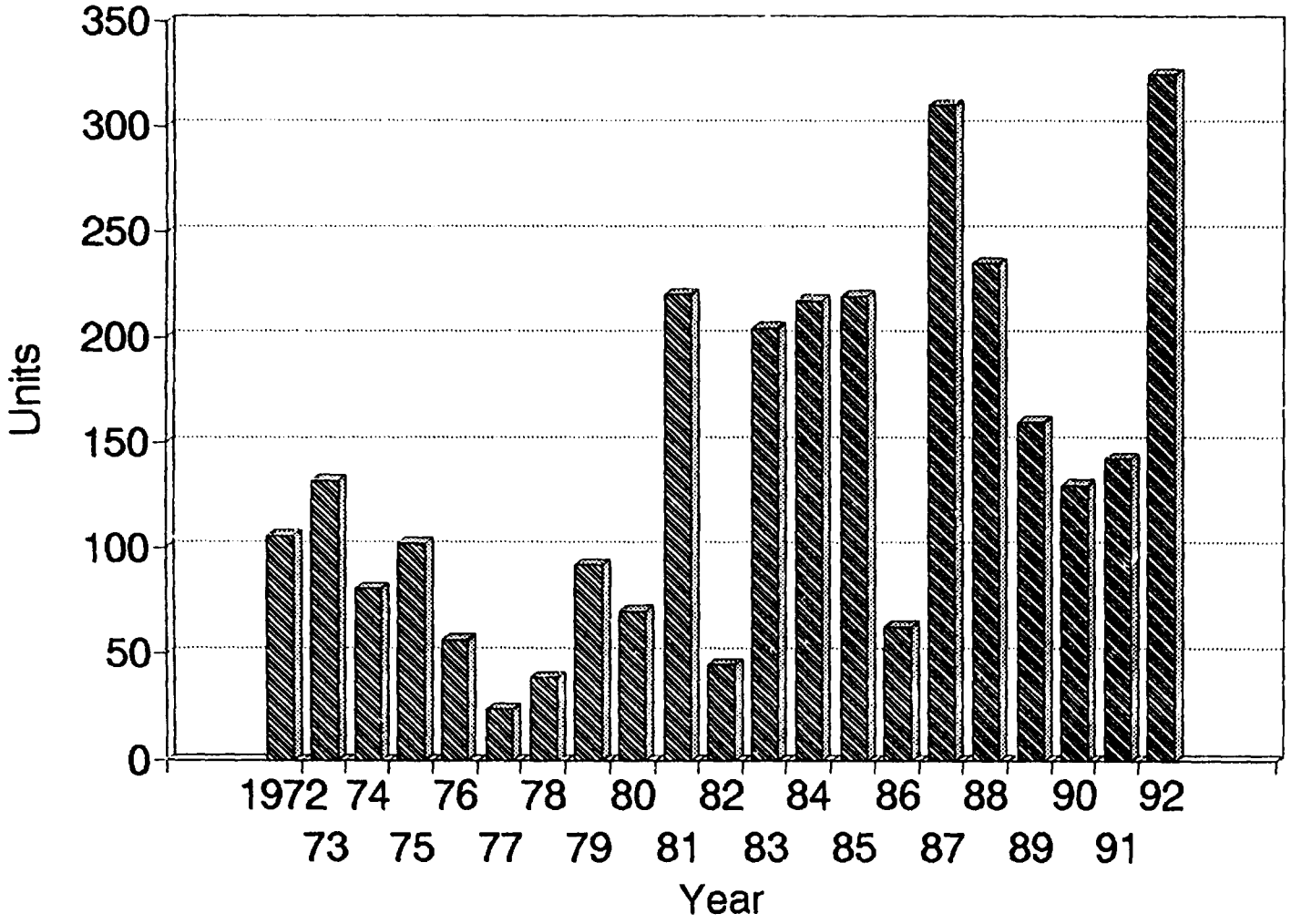
Annual Increases in Passenger Car Registration (private)



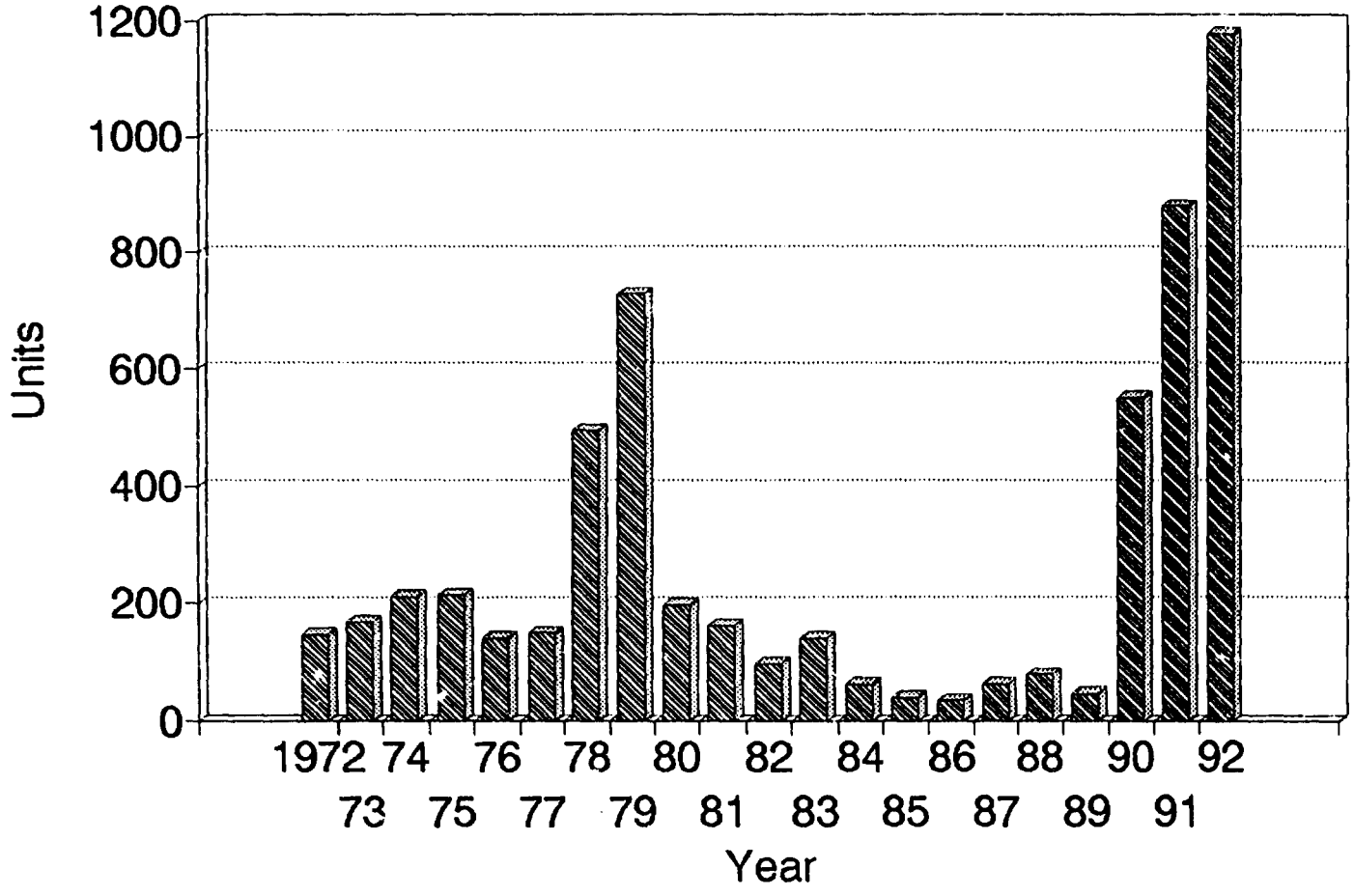
Annual Increases in Passenger Car Registration (other)



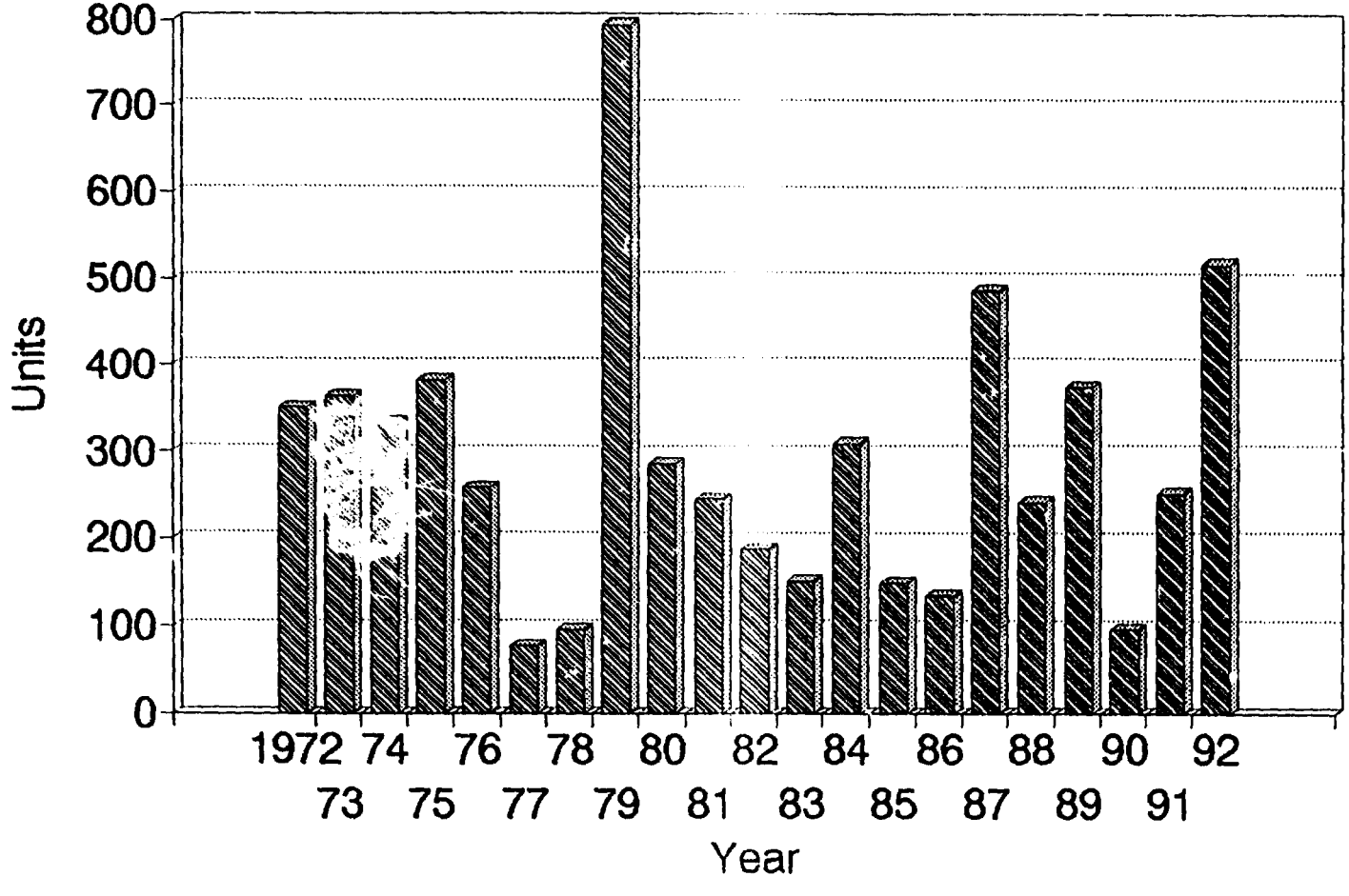
Annual Increases in Bus Registration



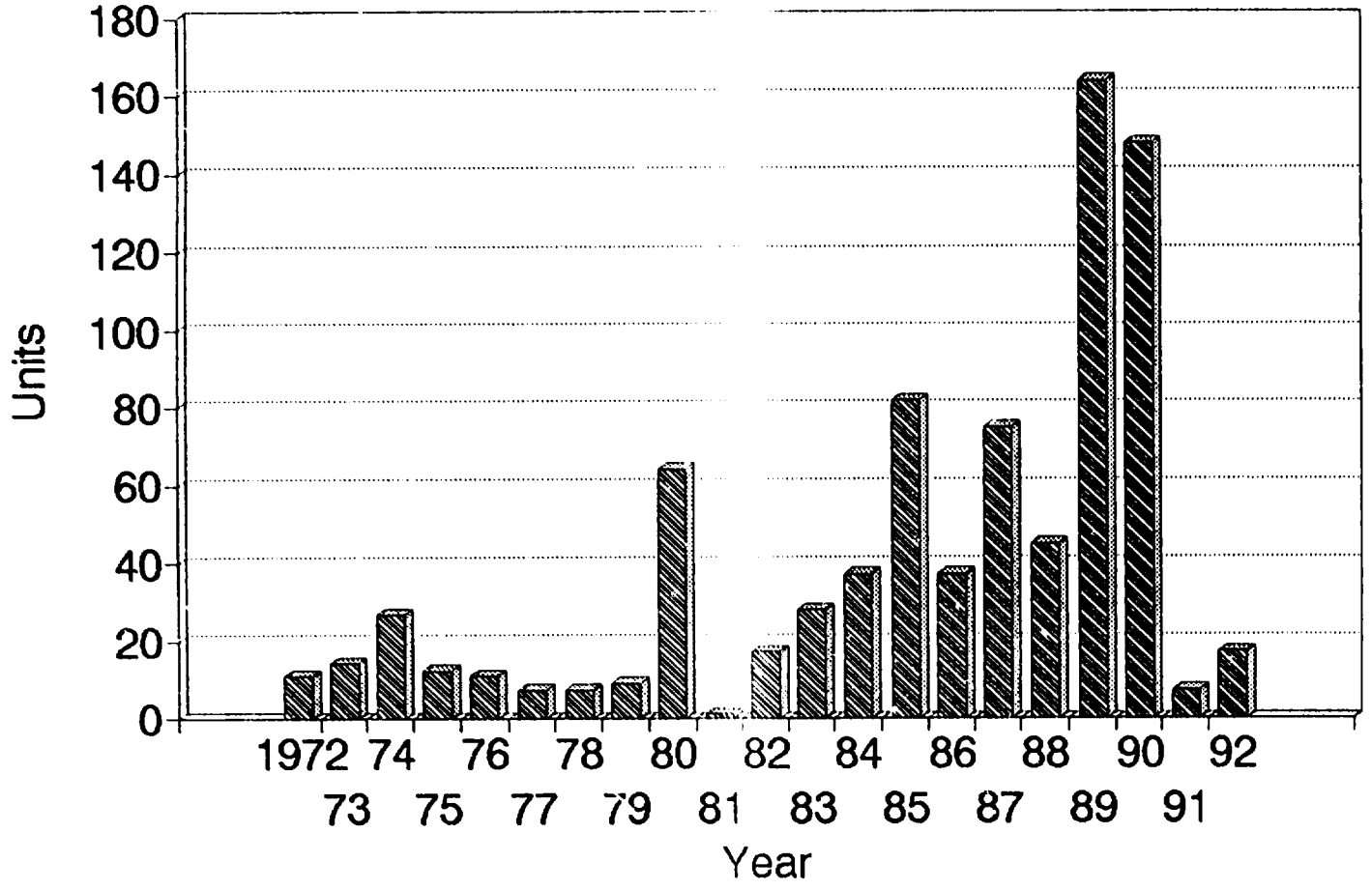
Annual Increases in Light Truck Registration



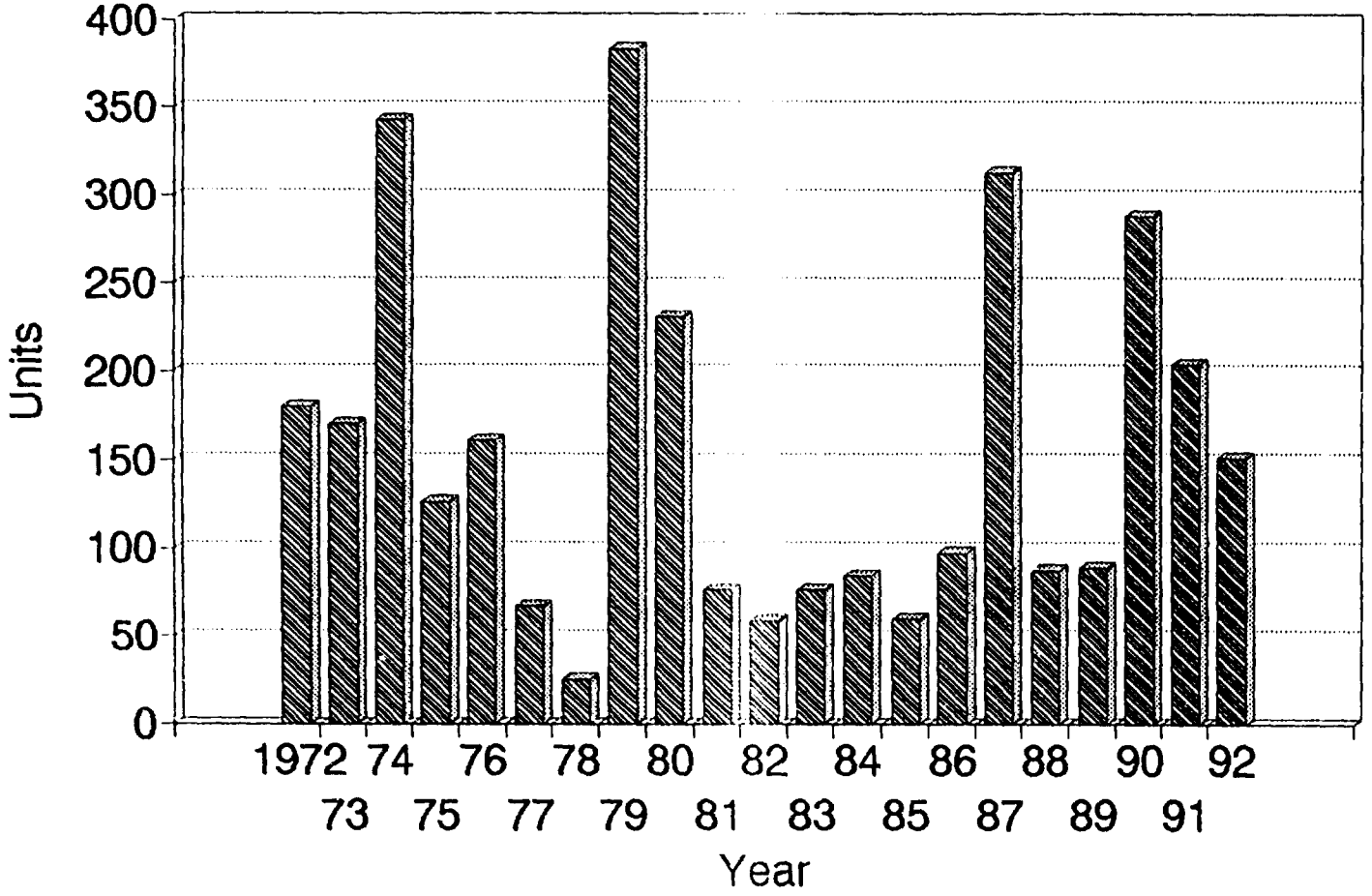
Annual Increases in Heavy Truck Registration



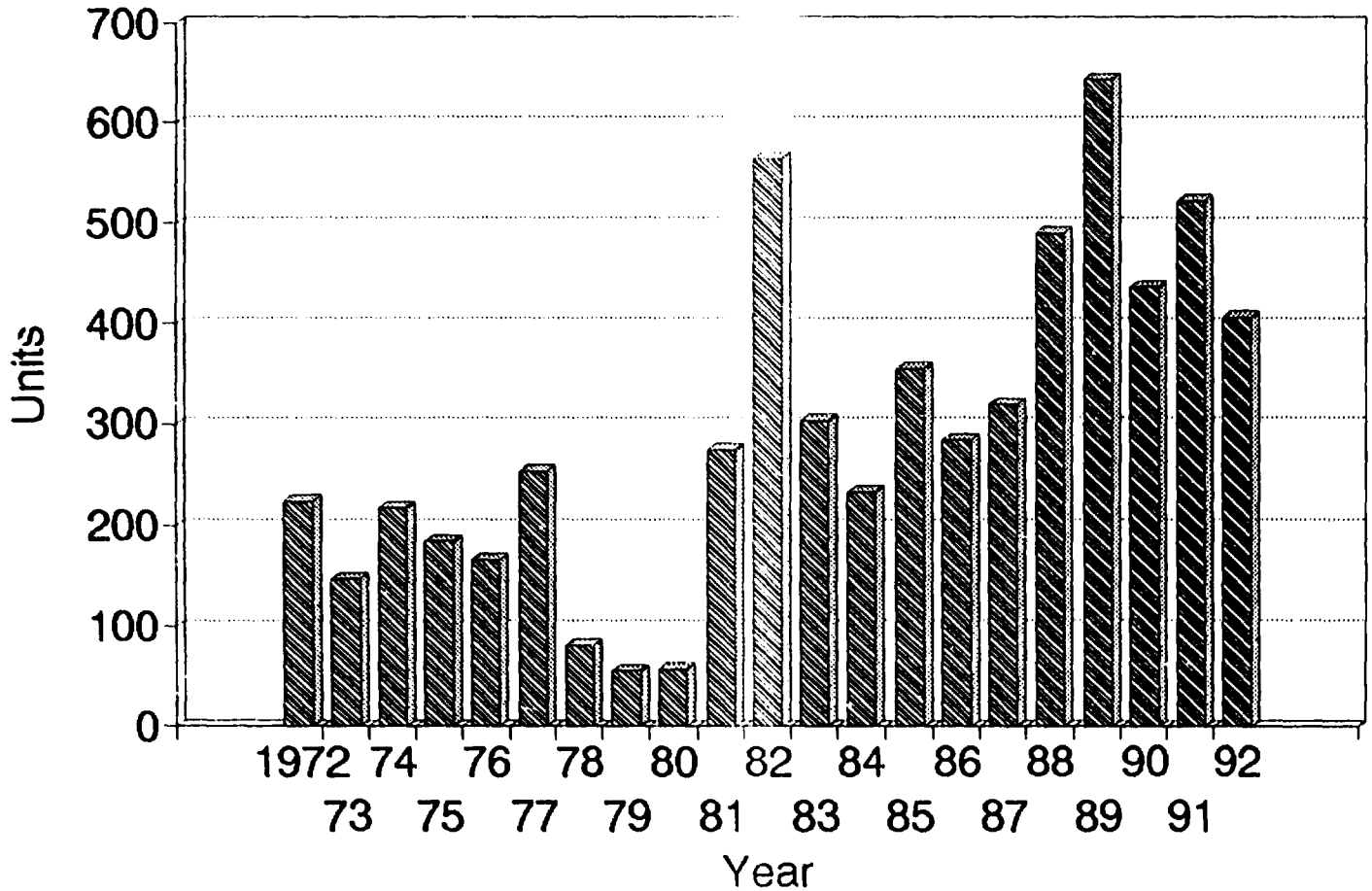
Annual Increases in Tanker Registration



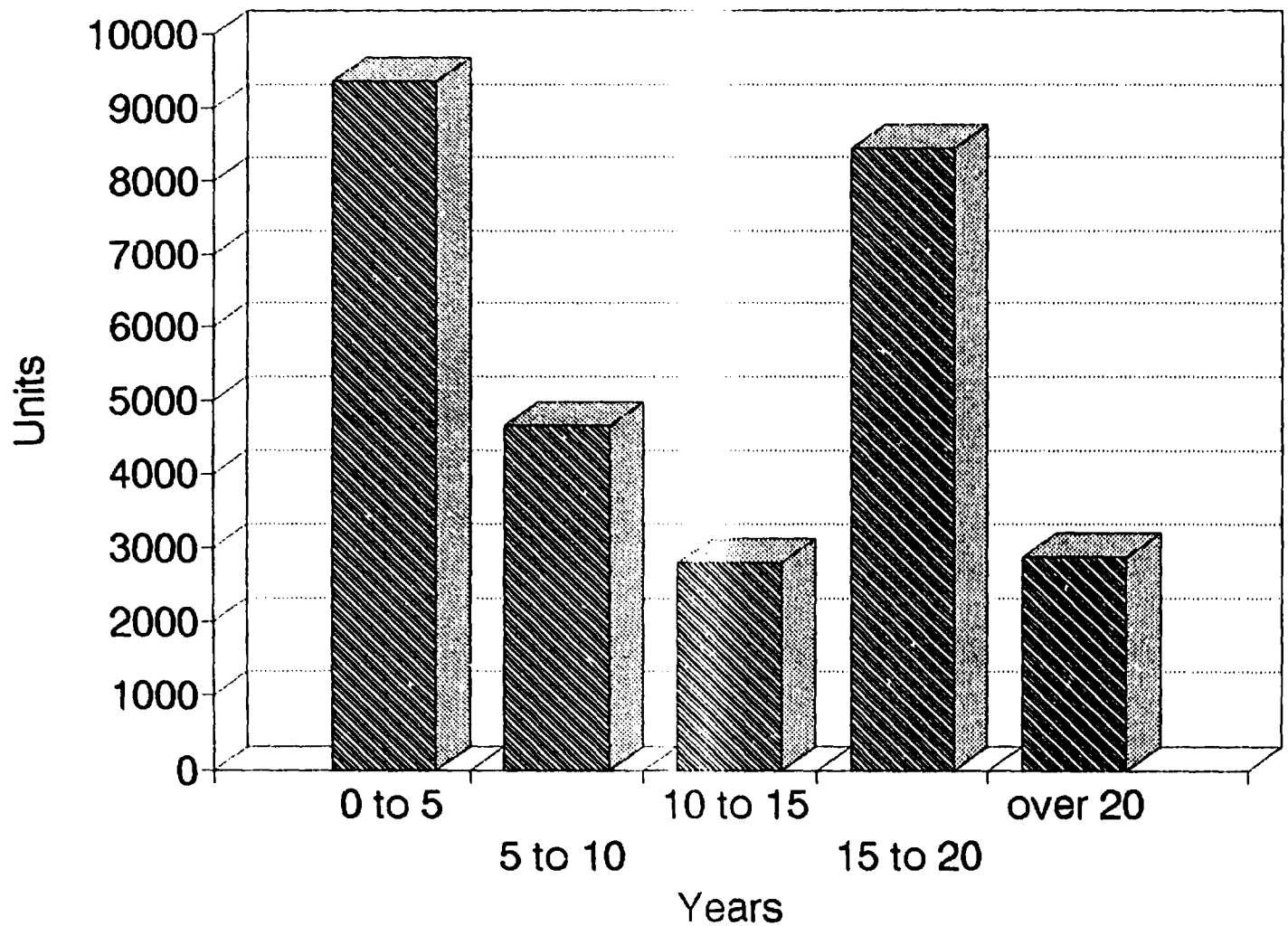
Annual Increases in Trailer Registration



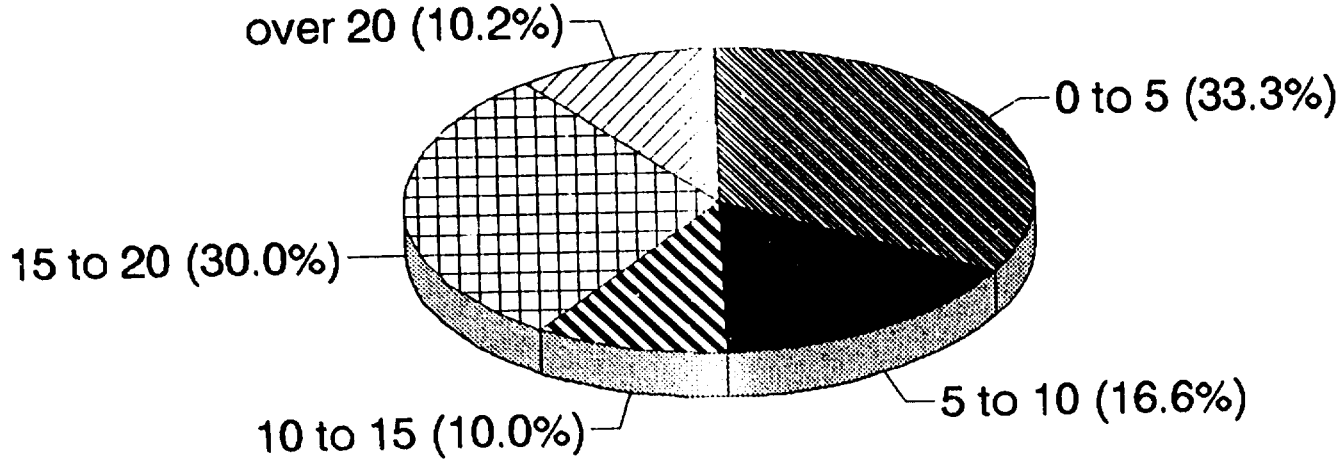
Annual Increases in Motorcycle Registration



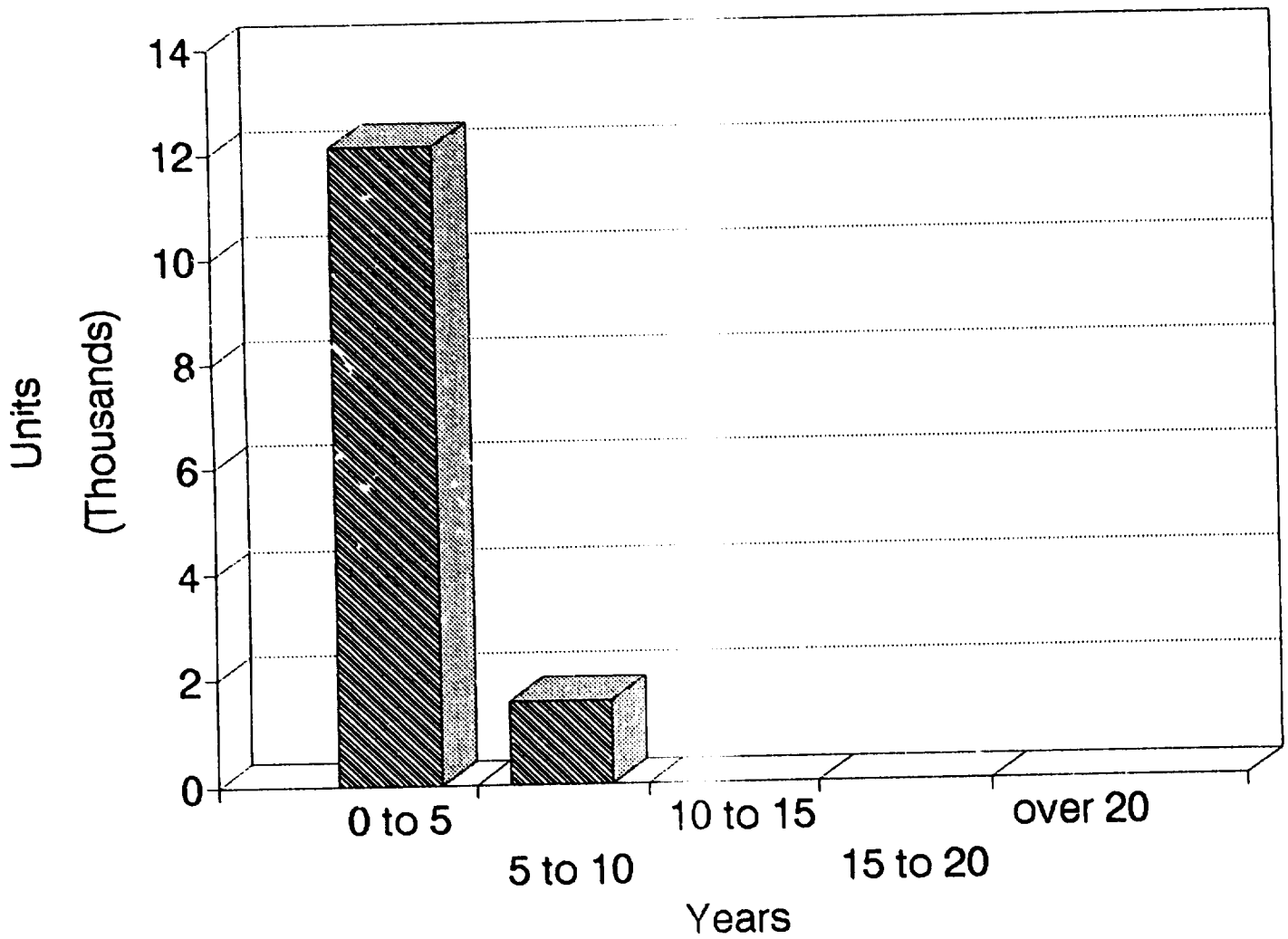
Age of Private Passenger Cars



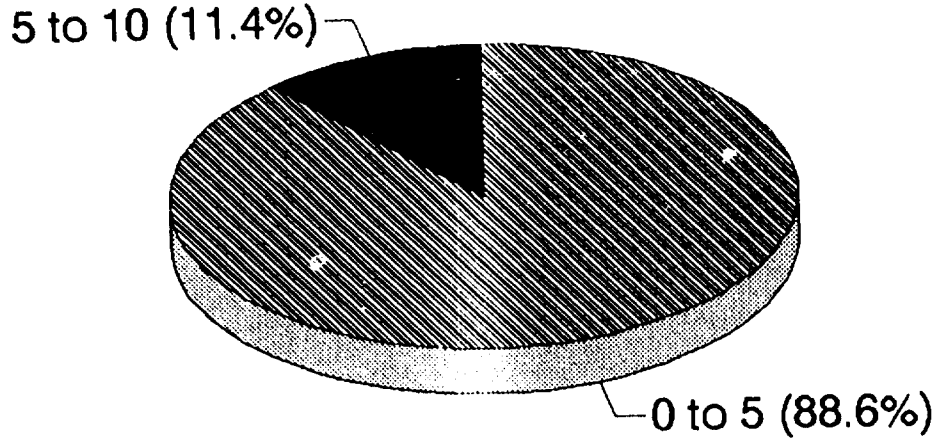
Age of Private Passenger Cars
(in %)



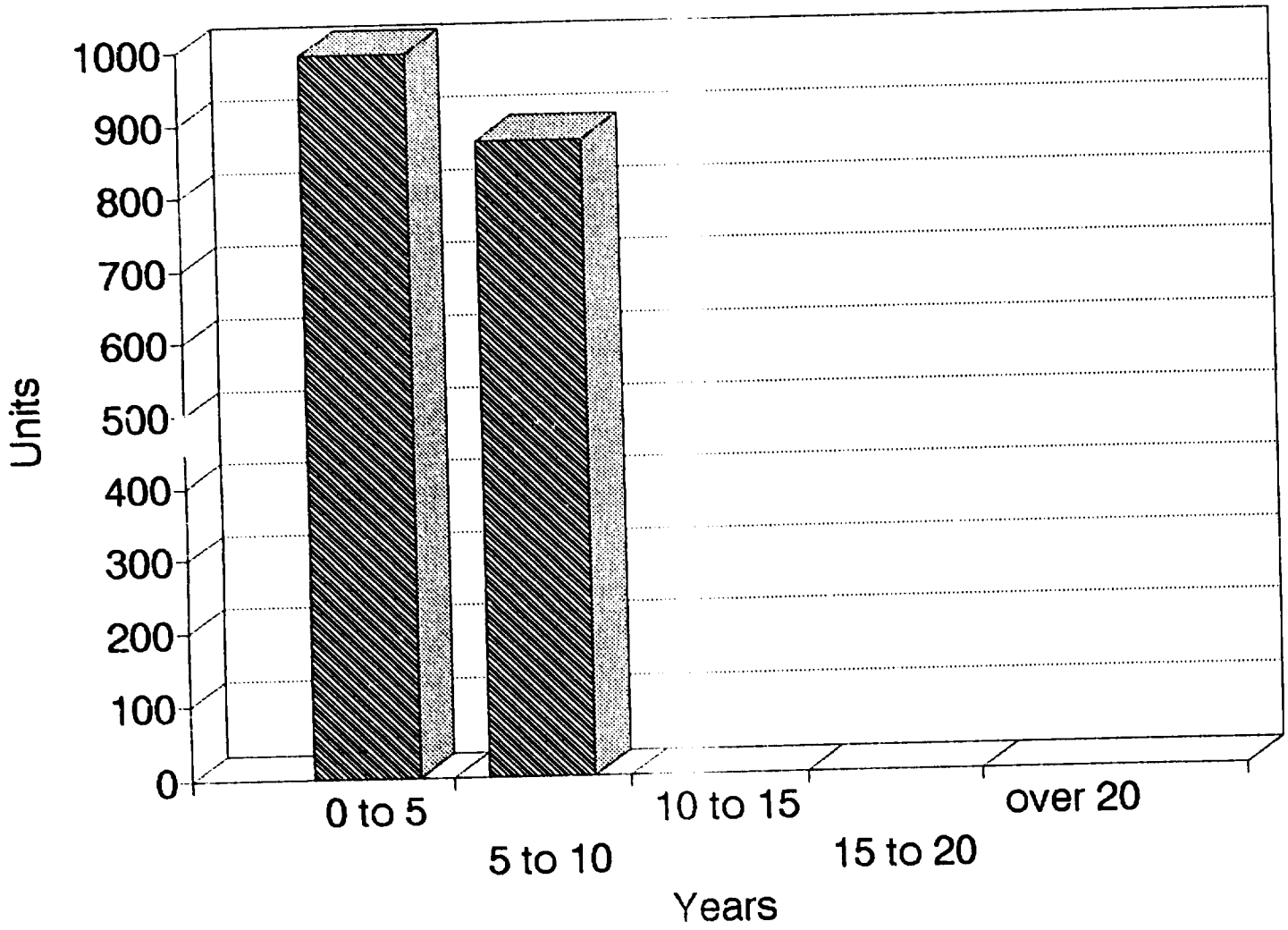
Age of Other Passenger Cars



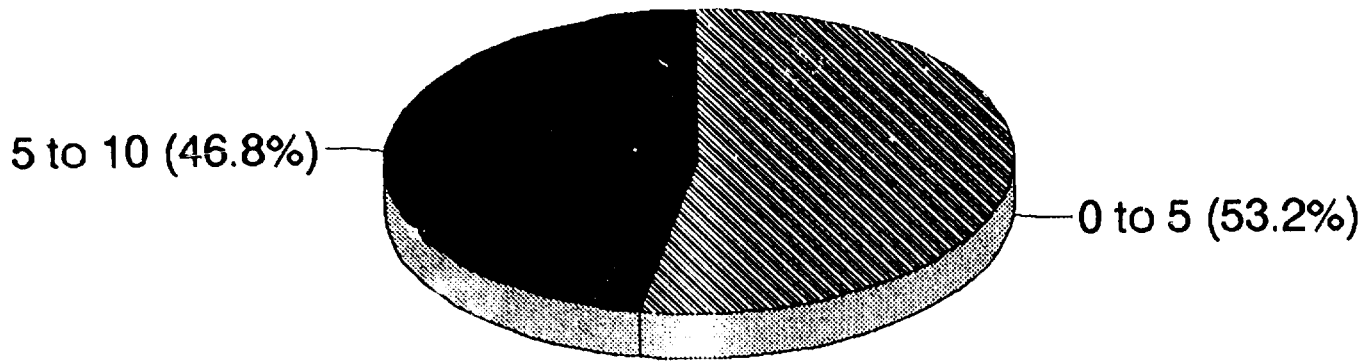
Age of Other Passenger Cars
(in%)



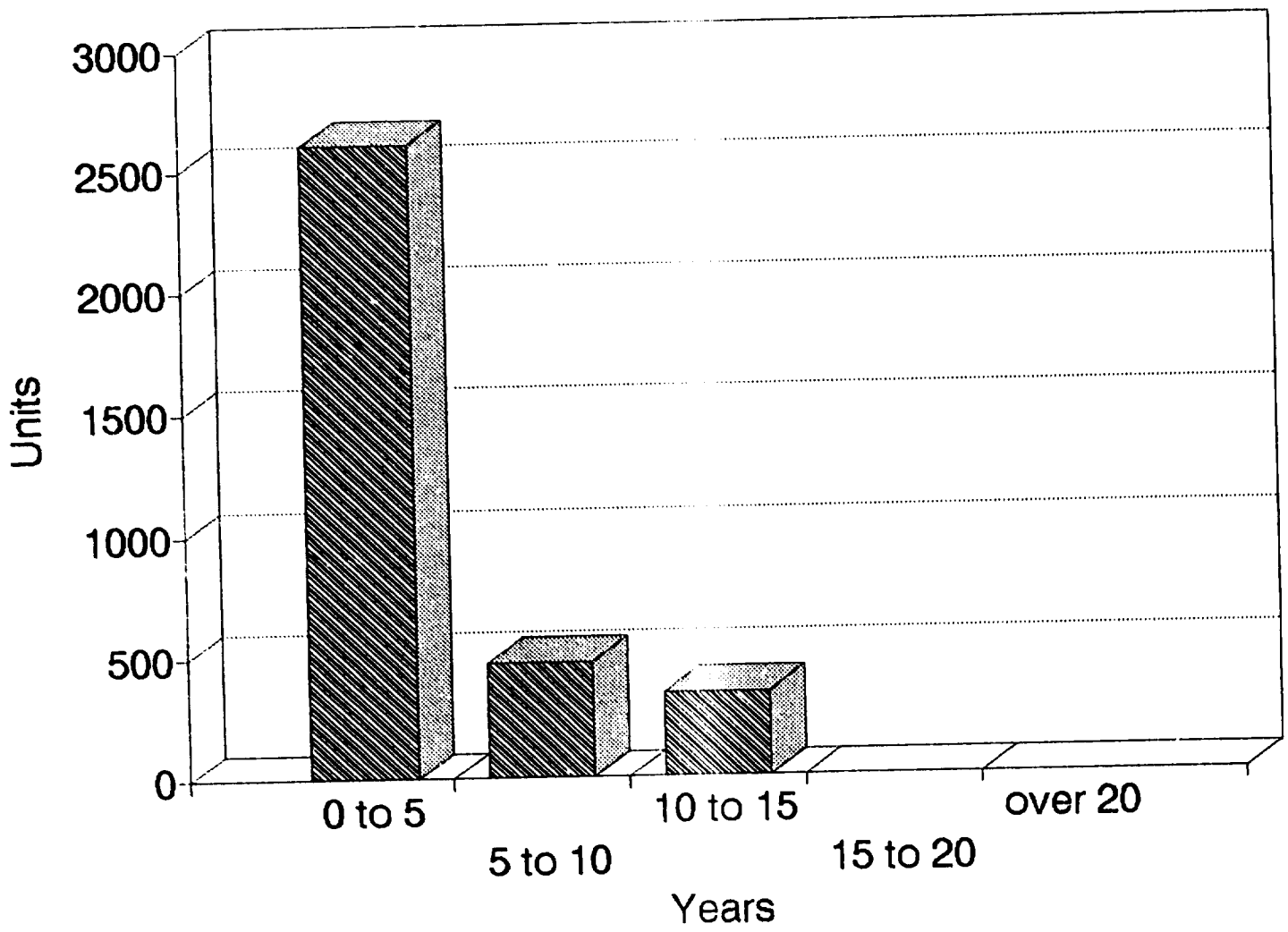
Age of Buses


1000
900
800
700
600
500
400
300
200
100
0
Units
0 to 5
5 to 10
10 to 15
15 to 20
over 20
Years

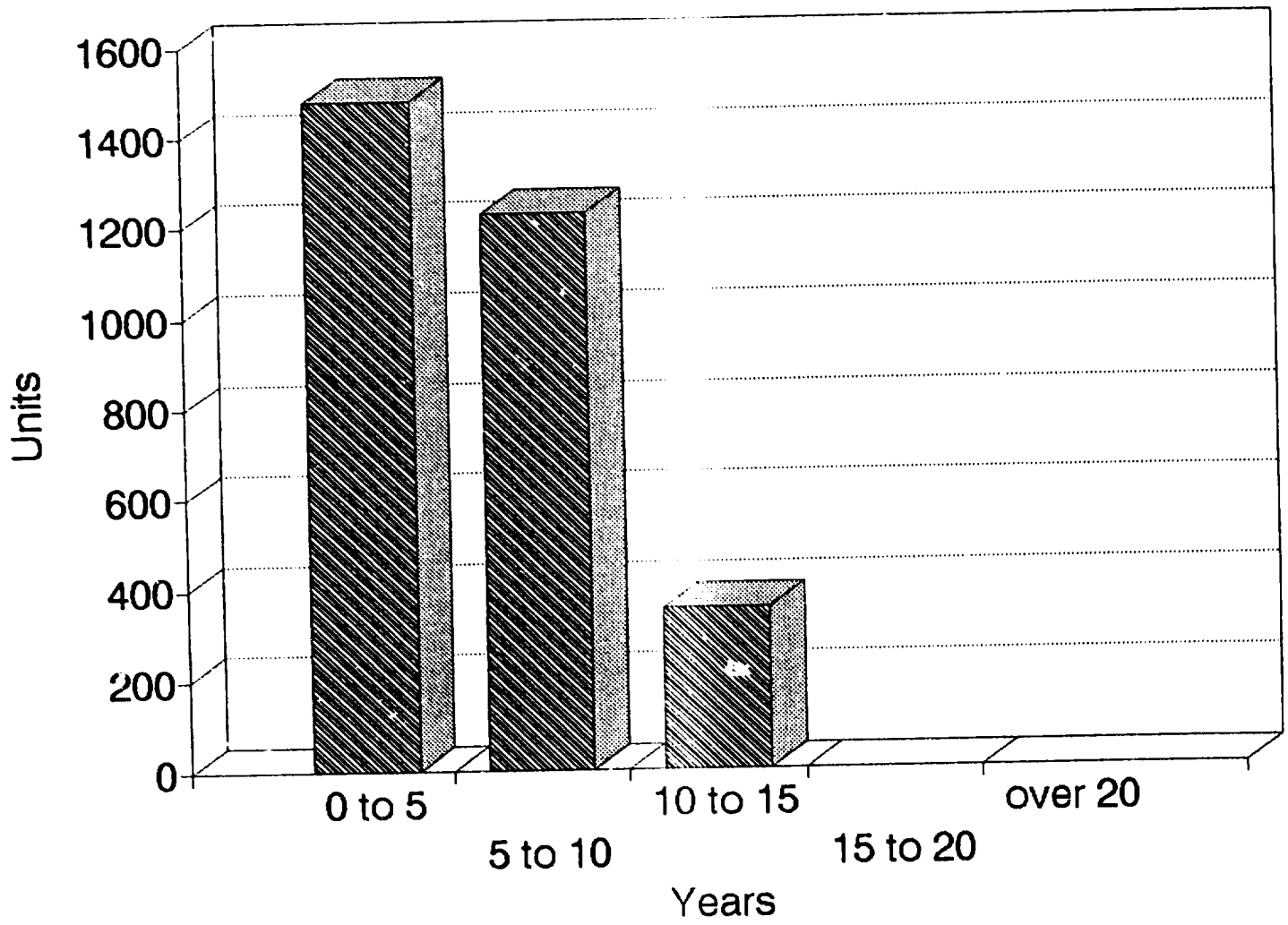
Age of Buses
(in %)



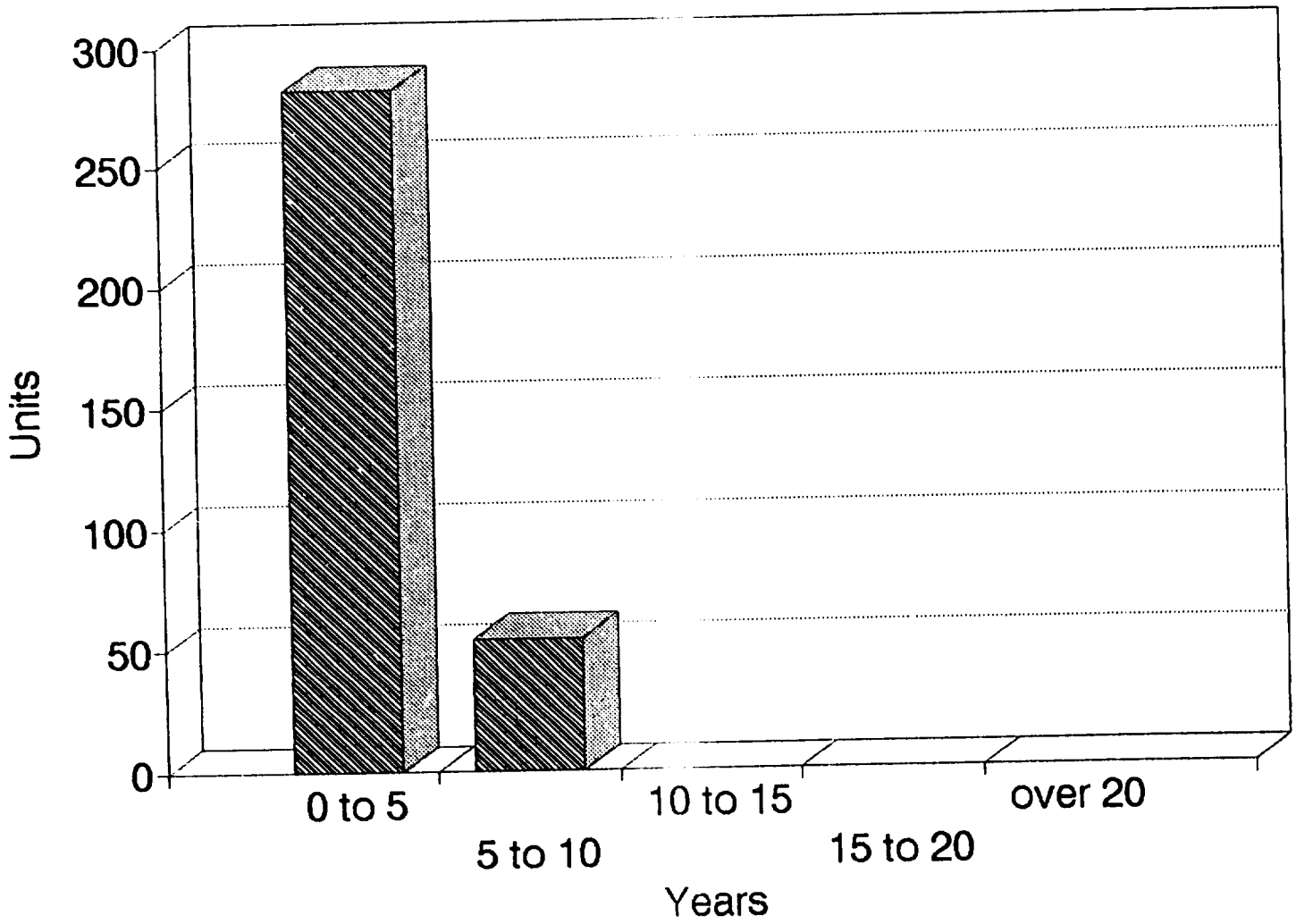
Age of Trucks under 10t



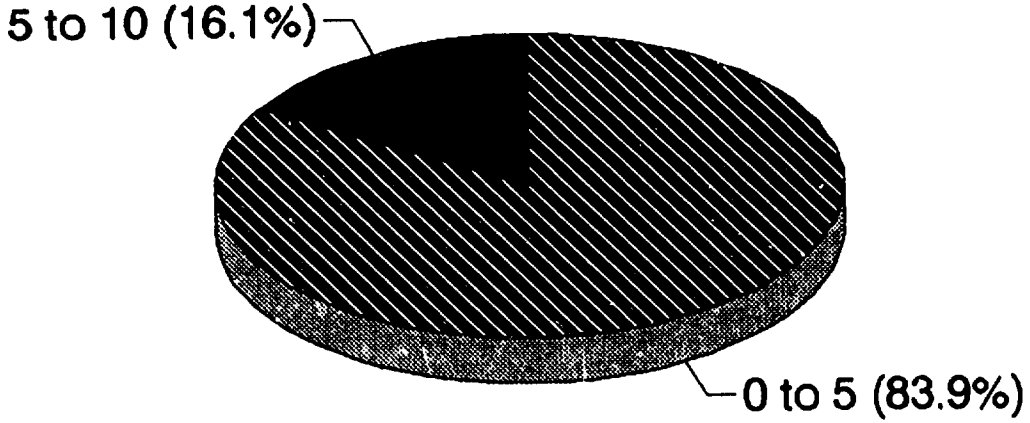
Age of Trucks over 10t



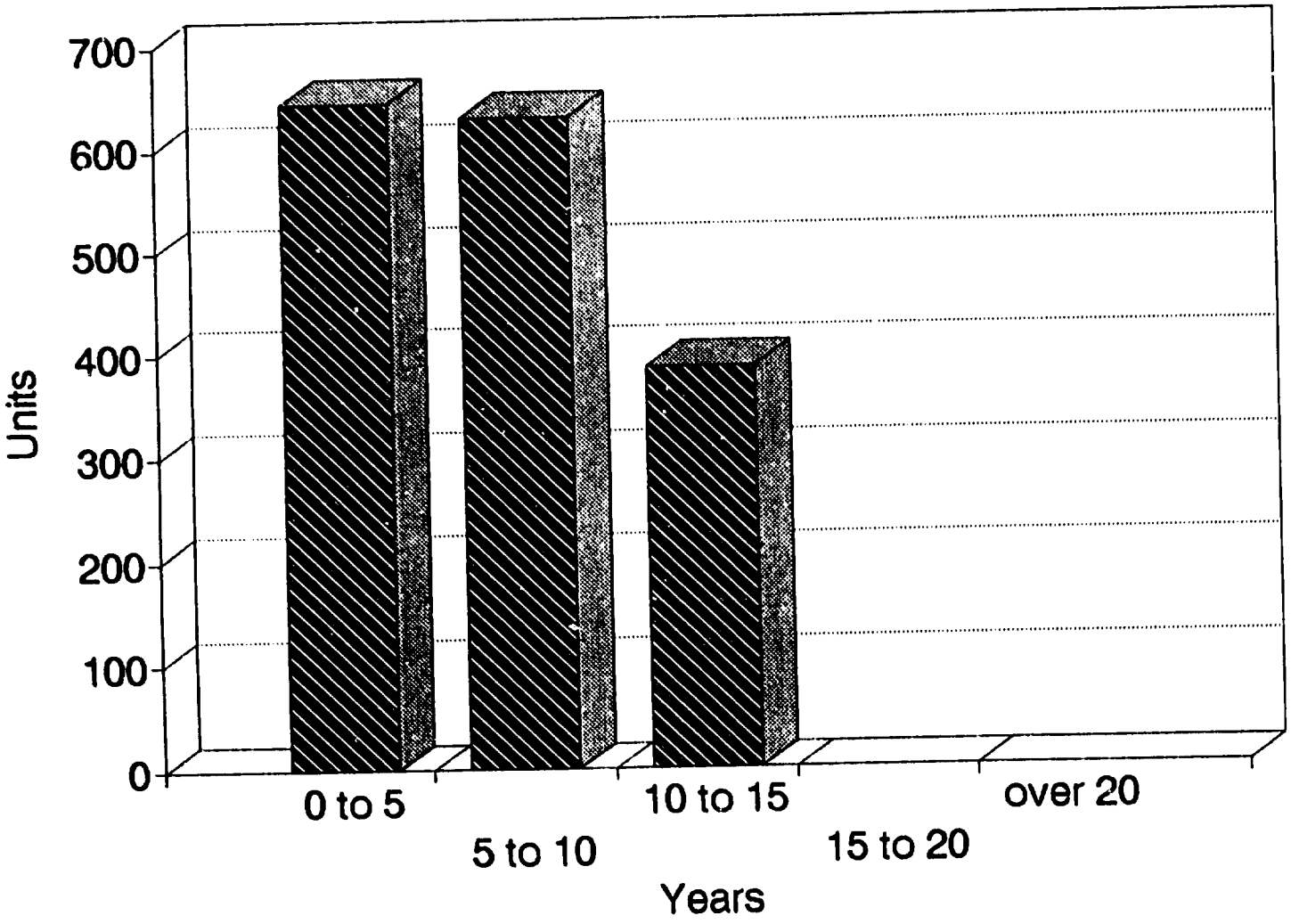
Age of Tankers



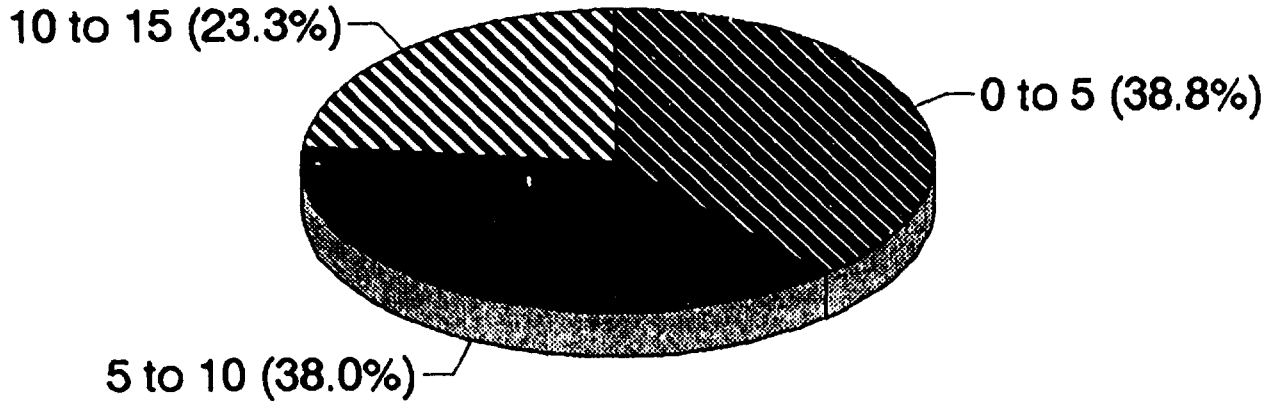
Age of Tankers
(in %)



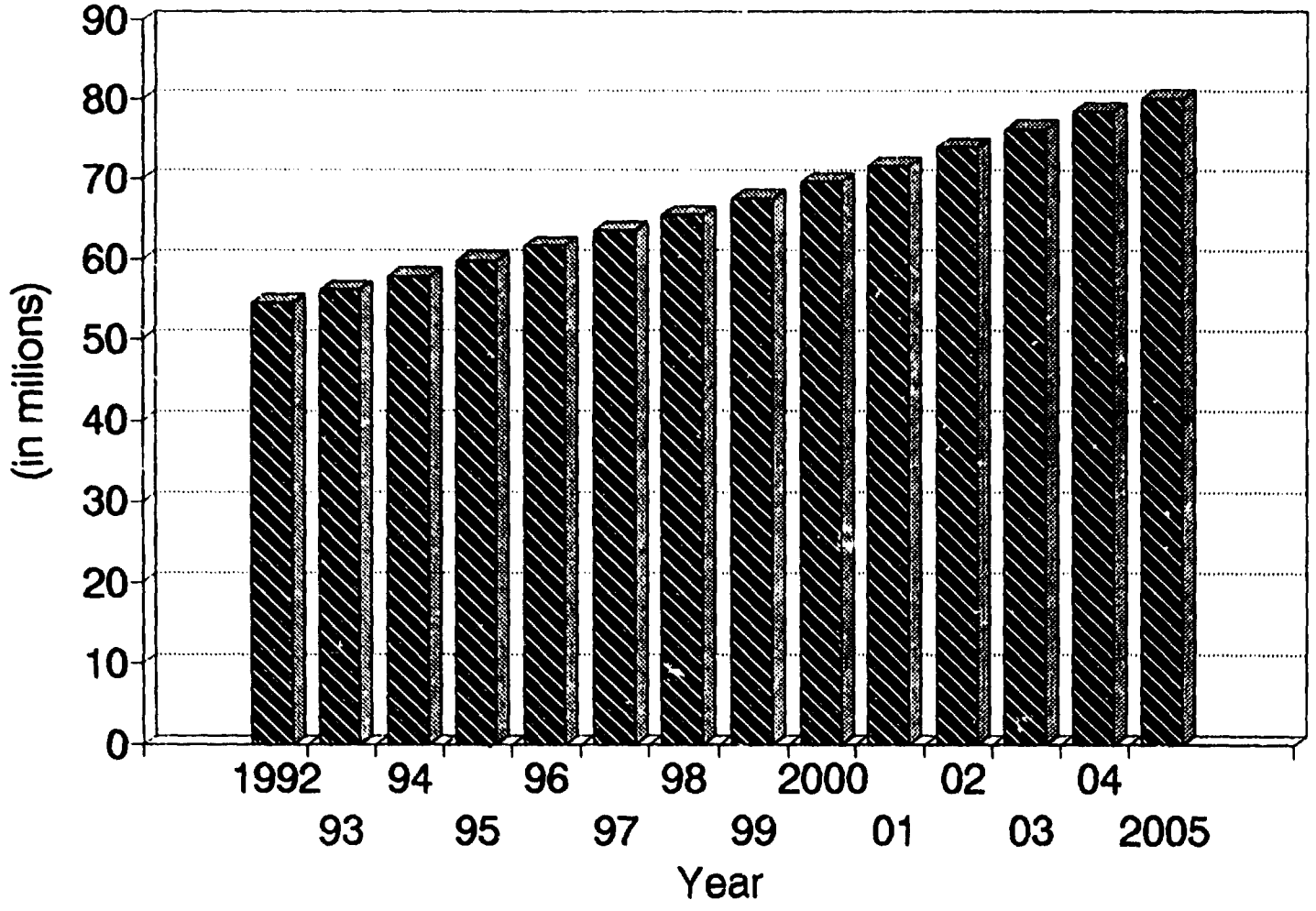
Age of Trailers



Age of Trailers
(in %)



Population 1992-2005



ANNEX NO. 5

Support data and economic evalution calculations

Results of Financial and Economical Analysis

VARIANT 1

3000 Trucks per year

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.1

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111090.00	51.931 % foreign
current assets:	450.00	100.000 % foreign
total assets:	111540.00	52.125 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	69000.00	
local loans :	53000.00	
total funds :	122000.00	56.557 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	36316.10	142053.00	177675.80
depreciation :	6293.14	6788.59	6788.59
interest :	7420.00	5607.50	0.00
production costs	50029.24	154449.10	184464.30
thereof foreign	29.48 %	39.13 %	39.53 %
total sales :	40161.00	229603.00	293038.00
gross income :	-14608.24	50540.86	83722.25
net income :	-14608.24	22743.39	37675.01
cash balance :	-30296.55	-3751.97	42621.45
net cashflow :	-22876.55	27938.86	42621.45

Net Present Value at: 11.50 % = 55123.19
Internal Rate of Return: 16.60 %
Return on equity1: 61.37 %
Return on equity2: 20.98 %

Index of Schedules produced by COMFAR

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Total Initial Investment in thousand USD

Year	1995	1996	1997
Fixed investment costs			
Land, site preparation, development	1215.000	530.000	0.000
Buildings and civil works	5070.000	12580.000	13020.000
Auxiliary and service facilities	2540.000	7240.000	8680.000
Incorporated fixed assets	320.000	325.000	430.000
Plant machinery and equipment	4270.000	23140.000	27760.000
Total fixed investment costs	13415.000	43815.000	49890.000
Pre-production capital expenditures.	0.000	0.000	3970.000
Net working capital	0.000	0.000	450.000
Total initial investment costs	13415.000	43815.000	54310.000
Of it foreign, in %	31.830	52.813	56.583

COMFAR 2.1 UNID

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ----

Total Current Investment in thousand USD

Year	1998	1999	2000	2001	2002
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	3630.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	1100.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	690.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	3350.000	0.000	0.000	0.000	0.000
Total fixed investment costs	8770.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	2040.000	0.000	0.000	0.000	0.000
Working capital	11171.450	6458.335	7989.426	5769.591	7200.644
Total current investment costs	21981.450	6458.335	7989.426	5769.591	7200.644
Of it foreign, %	46.304	42.001	42.381	44.503	45.570

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ----

Total Current Investment in thousand USD

Year	2003	2004	2005	2006	2007
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	1755.988	1620.438	1912.521	901.385	1842.150
Total current investment costs	1755.988	1620.438	1912.521	901.385	1842.150
Of it foreign, %	19.275	81.815	7.249	87.373	44.890

COMFAR 2.1 UNIDO

Total Current Investment in thousand USD

Year	2008	2009	2010	2011	2012
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	1934.258	2030.971	2132.531	2239.145	2351.109
Total current investment costs	1934.258	2030.971	2132.531	2239.145	2351.109
Of it foreign, %	44.890	44.890	44.890	44.890	44.890

COMFAR 2.1 UNIDO

Total Production Costs in thousand USD

Year	1998	1999	2000	2001	2002
% of nom. capacity (single product).	22.000	43.333	68.333	83.333	100.000
Raw material 1	20079.400	41527.840	68760.520	88047.020	110939.200
Other raw materials	2312.200	4554.333	7181.833	9758.333	10510.000
Utilities	2096.080	2730.420	3518.518	4104.938	4789.094
Energy	98.420	128.205	165.210	192.745	224.869
Labour, direct	1666.200	1233.050	911.584	1167.272	1470.762
Repair, maintenance	1223.800	1349.950	1497.379	1622.604	1762.484
Spares	320.000	332.000	344.600	357.830	918.699
Factory overheads	5100.000	5355.000	5622.749	5903.887	6199.081
Factory costs	32896.100	57210.800	88002.400	110154.600	136814.200
Administrative overheads	2710.000	2845.500	2987.775	3137.163	3294.021
Indir. costs, sales and distribution	710.000	745.500	782.775	821.914	863.009
Direct costs, sales and distribution	280.000	913.500	1146.602	1528.063	1944.813
Depreciation	6293.140	6788.590	6788.590	6788.590	6788.590
Financial costs	7420.000	15010.000	11875.830	8741.667	5607.501
Total production costs	50309.240	83513.390	111584.000	131172.000	155312.200
Costs per unit (single product)	76.226	64.241	54.431	52.469	51.771
Of it foreign, %	29.874	39.447	39.124	39.168	39.465
Of it variable,%	46.803	58.386	71.674	77.730	82.338
Total labour	2186.200	1779.050	1484.384	1769.237	2102.826

Total Production Costs in thousand USD

Year	2003	2004	2005	2006	2007
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	116486.200	122310.500	128426.000	134847.300	141589.700
Other raw materials	10510.000	10510.000	10510.000	10510.000	10510.000
Utilities	5028.548	5279.976	5543.974	5821.173	6112.231
Energy	236.112	247.918	260.314	273.329	286.996
Labour, direct	1544.300	1621.515	1702.591	1787.721	1877.106
Repair, maintenance	6509.035	1943.138	8864.730	2142.310	2249.425
Spares	386.308	1379.893	417.704	434.589	452.319
Factory overheads	6509.035	6834.486	7176.210	7535.021	791[illegible].771
Factory costs	147209.500	150127.400	162901.500	163351.500	170989.500
Administrative overheads	3458.722	3631.659	3813.241	4003.903	4204.098
Indir. costs, sales and distribution	906.160	951.468	999.041	1048.993	1101.443
Direct costs, sales and distribution	2042.031	2144.156	2251.359	2363.938	2482.125
Depreciation	6788.590	6788.590	6788.590	6788.590	6788.590
Financial costs	2473.334	0.000	0.000	0.000	0.000
Total production costs	162878.400	163643.300	176753.800	177556.900	185565.800
Costs per unit (single product)	54.293	54.548	58.918	59.186	61.855
Of it foreign, %	37.817	40.000	38.193	39.811	39.892
Of it variable,%	82.067	85.398	82.674	86.074	86.151
Total labour	2207.967	2318.365	2434.283	2555.997	2683.797

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ----

Total Production Costs in thousand USD

Year	2008	2009	2010	2011	2012
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	148669.200	156102.600	163907.700	172103.100	180708.300
Other raw materials	10510.000	10510.000	10510.000	10510.000	10510.000
Utilities	6417.842	6738.734	7075.670	7429.454	7800.926
Energy	301.345	316.413	332.233	348.845	366.287
Labour, direct	1970.962	2069.510	2172.985	2281.634	2395.716
Repair, maintenance	2361.896	2479.991	2603.990	2734.190	2870.899
Spares	470.935	490.481	511.005	532.556	555.183
Factory overheads	8307.359	8722.727	9158.862	9616.806	10097.650
Factory costs	179009.500	187430.500	196272.500	205556.600	215304.900
Administrative overheads	4414.303	4635.018	4866.768	5110.106	5365.611
Indir. costs, sales and distribution	1156.515	1214.340	1275.057	1338.810	1405.751
Direct costs, sales and distribution	2606.250	2736.563	2873.375	3017.063	3167.875
Depreciation	6788.590	6788.590	6788.590	6788.590	6512.735
Financial costs	0.000	0.000	0.000	0.000	0.000
Total production costs	193975.200	202805.000	212076.300	221811.200	231756.900
Costs per unit (single product)	64.658	67.602	70.692	73.937	77.252
Of it foreign, %	39.969	40.044	40.116	40.184	40.179
Of it variable,%	86.224	86.295	86.363	86.429	86.594
Total labour	2817.987	2958.886	3106.830	3262.171	3425.280

COMFAR 2.1 UNIDO

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year			1998	1999	2000	2001	2002
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	3421.342	5913.775	8901.629	11145.150	13888.840
Inventory and materials	58	6.2	7487.756	11437.950	16416.830	19895.630	24004.840
Energy	1	360.0	0.273	0.356	0.459	0.535	0.625
Spares	166	2.2	140.000	146.000	152.300	158.915	439.350
Work in progress	15	24.0	1370.671	2383.784	3666.767	4589.776	5700.593
Finished products	15	24.0	1483.588	2502.346	3791.257	4720.491	5837.844
Cash in hand	15	24.0	459.167	463.146	473.504	507.865	568.544
Total current assets			14362.800	22847.350	33402.750	41018.360	50440.640
Current liabilities and Accounts payable	30	12.0	2741.342	4767.567	7333.533	9179.552	11401.190
Net working capital			11621.460	18079.790	26069.220	31838.800	39039.450
Increase in working capital			11171.460	6458.330	7989.432	5769.583	7200.648
Net working capital, local			5783.054	9528.835	14132.290	17334.230	21253.510
Net working capital, foreign			5838.400	8550.954	11936.920	14504.580	17785.940

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year			2003	2004	2005	2006	2007
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	14780.540	15050.390	16142.930	16209.860	16877.270
Inventory and materials	58	6.2	24930.000	25901.420	26921.400	27992.390	29116.920
Energy	1	360.0	0.656	0.689	0.723	0.759	0.797
Spares	166	2.2	173.154	669.946	188.852	197.295	206.159
Work in progress	15	24.0	6133.730	6255.310	6787.564	6806.312	7124.563
Finished products	15	24.0	6277.844	6406.628	6946.449	6973.141	7299.734
Cash in hand	15	24.0	766.975	642.112	915.603	662.648	695.613
Total current assets			53062.900	54926.500	57903.530	58842.400	61321.050
Current liabilities and Accounts payable	30	12.0	12267.460	12510.620	13575.130	13612.620	14249.130
Net working capital			40795.440	42415.880	44328.400	45229.780	47071.930
Increase in working capital			1755.984	1620.438	1912.523	901.383	1842.148
Net working capital, local			22671.030	22965.710	24739.590	24853.400	25868.610
Net working capital, foreign			18124.400	19450.170	19588.810	20376.380	21203.320

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 UNIDO

Net Working Capital in thousand USD

Year	adc	coto	2008	2009	2010	2011	2012
Coverage							
Current assets &							
Accounts receivable	30	12.0	17578.040	18313.860	19086.470	19897.710	20749.510
Inventory and materials	58	6.2	30297.690	31537.480	32839.270	34206.160	35641.380
Energy	1	360.0	0.837	0.879	0.923	0.969	1.017
Spares	166	2.2	215.467	225.241	235.503	246.278	257.592
Work in progress	15	24.0	7458.729	7809.603	8178.020	8564.857	8971.038
Finished products	15	24.0	7642.658	8002.728	8380.802	8777.779	9194.605
Cash in hand	15	24.0	730.228	766.572	804.734	844.804	886.878
Total current assets			63923.650	66656.370	69525.730	72538.550	75702.020
Current liabilities and							
Accounts payable	30	12.0	14917.460	15619.210	16356.040	17129.710	17942.080
Net working capital			49006.190	51037.160	53169.690	55408.840	57759.940
Increase in working capital			1934.262	2030.973	2132.523	2239.152	2351.098
Net working capital, local			26934.580	28053.850	29229.090	30463.080	31758.770
Net working capital, foreign			22071.610	22983.310	23940.610	24945.760	26001.170

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ----

Source of Finance, construction in thousand USD

Year	1995
Equity, ordinary ..	0.000
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	69000.000
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	53000.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	122000.000
Current liabilities	0.000
Bank overdraft	0.000
Total funds	122000.000

COMFAR 2.1 UNID

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ----

Source of Finance, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	-17250.000	-17250.000	-17250.000	-17250.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	-8833.333	-8833.333	-8833.333	-8833.333	-8833.333
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	-26083.330	-26083.330	-26083.330	-26083.330	-8833.333
Current liabilities	2741.342	2026.226	2565.966	1846.019	2221.634	866.276
Bank overdraft	19836.550	33976.210	12130.520	10602.910	3752.016	-20703.940
Total funds	22577.890	9919.105	-11386.850	-13634.400	-20109.680	-28670.990

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Source of Finance, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	-8833.336	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-8833.336	0.000	0.000	0.000	0.000	0.000
Current liabilities	243.158	1064.510	37.493	636.504	668.331	701.748
Bank overdraft	-25919.620	-30374.650	0.000	0.000	0.000	0.000
Total funds	-34509.800	-29310.140	37.493	636.504	668.331	701.748

Source of Finance, production in thousand USD

Year	2010	2011	2012
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	0.000	0.000	0.000
Current liabilities	736.834	773.676	812.360
Bank overdraft	0.000	0.000	0.000
Total funds	736.834	773.676	812.360

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Cashflow Tables, construction in thousand USD

Year	1995	1996	1997
Total cash inflow . .	122000.000	0.000	0.000
Financial resources .	122000.000	0.000	0.000
Sales, net of tax . .	0.000	0.000	0.000
Total cash outflow . .	13415.000	43815.000	54310.000
Total assets	13415.000	43815.000	54310.000
Operating costs . . .	0.000	0.000	0.000
Cost of finance . . .	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax . . .	0.000	0.000	0.000
Dividends paid . . .	0.000	0.000	0.000
Surplus (deficit) .	108585.000	-43815.000	-54310.000
Cumulated cash balance	108585.000	64770.000	10460.000
Inflow, local	53000.000	0.000	0.000
Outflow, local	9145.000	20675.000	23580.000
Surplus (deficit) .	43855.000	-20675.000	-23580.000
Inflow, foreign . . .	69000.000	0.000	0.000
Outflow, foreign . . .	4270.000	23140.000	30730.000
Surplus (deficit) .	64730.000	-23140.000	-30730.000
Net cashflow	-13415.000	-43815.000	-54310.000
Cumulated net cashflow	-13415.000	-57230.000	-111540.000

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Cashflow tables, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Total cash inflow	38442.340	77316.970	129303.600	168454.500	208074.700	218199.400
Financial resources	2741.342	2026.226	2565.966	5146.019	2221.634	866.276
Sales, net of tax	35701.000	75290.740	126737.600	163308.500	205853.000	217333.200
Total cash outflow	68738.900	111293.200	141434.100	175757.400	211826.600	197495.500
Total assets	24722.800	8484.559	10555.390	7615.608	9422.280	2622.263
Operating costs	36596.100	61715.300	92919.550	115641.900	142916.100	153616.400
Cost of finance	7420.000	15010.000	11875.830	8741.667	5607.501	2473.334
Repayment	0.000	26083.330	26083.330	26083.330	26083.330	8833.333
Corporate tax	0.000	0.000	0.000	17675.060	27797.470	29950.130
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	-30296.550	-33976.220	-12130.510	-7302.938	-3751.984	20703.950
Cumulated cash balance	-19836.550	-53812.770	-65943.280	-73246.220	-76998.200	-56294.250
Inflow, local	37497.910	64403.920	102620.000	123485.800	141677.400	148877.100
Outflow, local	46282.870	61503.300	80023.310	107706.000	132954.400	139303.100
Surplus (deficit)	-8784.957	2900.621	22596.680	15779.710	8722.984	9574.016
Inflow, foreign	944.433	12913.050	26683.610	44968.750	66397.240	69322.340
Outflow, foreign	22456.040	49789.900	61410.800	68051.380	78872.220	58192.410
Surplus (deficit)	-21511.600	-36876.850	-34727.200	-23082.630	-12474.980	11129.930
Net cashflow	-22876.560	7117.108	25828.650	24222.070	27938.830	32010.600
Cumulated net cashflow	-134416.600	-127299.500	-101470.800	-77248.730	-49309.890	-17299.300

COMFAR 2.1 UNI

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Cashflow tables, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Total cash inflow . .	229704.400	243108.700	255593.600	269924.500	284608.300	300026.200
Financial resources .	317.102	1064.510	259.727	636.504	668.331	701.748
Sales, net of tax . .	229387.300	242044.200	255333.900	269288.000	283939.900	299324.400
Total cash outflow . .	203784.300	208852.000	214706.800	227303.100	239269.800	251834.300
Total assets	1863.594	2977.033	938.875	2478.653	2602.592	2732.721
Operating costs . . .	156854.700	169965.200	170768.300	178777.200	187186.500	196016.400
Cost of finance . . .	0.000	0.000	0.000	0.000	0.000	0.000
Repayment	8907.280	0.000	222.234	0.000	0.000	0.000
Corporate tax . . .	36159.210	35909.720	42777.340	46047.240	49480.630	53085.710
Dividends paid . . .	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) .	25919.660	34256.720	40886.840	42621.470	45338.530	48191.410
Cumulated cash balance	-30374.590	3882.125	44768.970	87390.440	132729.000	180920.400
Inflow, local	156344.100	165805.000	173896.600	183700.200	193630.200	204056.700
Outflow, local	140604.700	144960.600	146893.300	156098.900	164505.400	173332.200
Surplus (deficit) .	15739.340	20844.310	27003.310	27601.280	29124.800	30724.480
Inflow, foreign . . .	73360.330	77303.730	81697.010	86224.340	90978.070	95969.460
Outflow, foreign . . .	63180.040	63891.330	67813.480	71204.160	74764.360	78502.580
Surplus (deficit) .	10180 290	13412.390	13883.530	15020.190	16213.710	17466.880
Net cashflow	34752.980	34256.710	40886.840	42621.470	45338.520	48191.400
Cumulated net cashflow	17453.680	51710.390	92597.230	135218.700	180557.200	228748.600

Cashflow tables, production in thousand USD

Year	2010	2011	2012
Total cash inflow	316215.000	333213.200	351061.300
Financial resources	736.834	773.676	812.360
Sales, net of tax	315478.100	332439.500	350248.900
Total cash outflow	265028.100	278880.900	293578.300
Total assets	2869.360	3012.825	3163.464
Operating costs	205287.700	215022.500	225244.200
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	56871.030	60845.590	65170.640
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	51186.910	54332.250	57483.000
Cumulated cash balance	232107.300	286439.500	343922.500
Inflow, local	215004.500	226499.700	238569.700
Outflow, local	182600.300	192331.900	202701.800
Surplus (deficit)	32404.190	34167.840	35867.910
Inflow, foreign	101210.400	106713.400	112491.600
Outflow, foreign	82427.700	86549.070	90876.530
Surplus (deficit)	18782.730	20164.370	21615.080
Net cashflow	51186.900	54332.240	57482.990
Cumulated net cashflow	279935.500	334267.800	391750.800

COMFAR 2.1 UNI

Cashflow Discounting:

a) Equity paid versus Net income flow:

Net present value	108595.30	at	11.50 %
Internal Rate of Return (IRRE1) ..	61.37 %		

b) Net Worth versus Net cash return:

Net present value	57840.77	at	11.50 %
Internal Rate of Return (IRRE2) ..	20.98 %		

c) Internal Rate of Return on total investment:

Net present value	55123.19	at	11.50 %
Internal Rate of Return (IRR) ..	16.60 %		

Net Worth = Equity paid plus reserves

Net Income Statement in thousand USD

Year	1998	1999	2000	2001	2002
Total sales, incl. sales tax	40161.000	84540.740	140637.600	181408.500	229603.000
Less: variable costs, incl. sales tax.	28006.100	58054.300	93983.610	120268.000	151975.700
Variable margin	12154.900	26486.440	46654.020	61140.450	77627.330
As % of total sales	30.265	31.330	33.173	33.703	33.809
Non-variable costs, incl. depreciation	19343.140	19699.590	19624.530	20262.310	21478.970
Operational margin	-7188.238	6786.844	27029.490	40878.140	56148.360
As % of total sales	-17.899	8.028	19.219	22.534	24.455
Cost of finance	7420.000	15010.000	11875.830	8741.667	5607.501
Gross profit	-14608.240	-8223.156	15153.660	32136.470	50540.860
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	-14608.240	-8223.156	15153.660	32136.470	50540.860
Tax	0.000	0.000	0.000	17675.060	27797.470
Net profit	-14608.240	-8223.156	15153.660	14461.410	22743.390
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	-14608.240	-8223.156	15153.660	14461.410	22743.390
Accumulated undistributed profit	-14608.240	-22831.390	-7677.738	6783.674	29527.060
Gross profit, % of total sales	-36.374	-9.727	10.775	17.715	22.012
Net profit, % of total sales	-36.374	-9.727	10.775	7.972	9.906
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	-5.284	4.848	18.267	15.093	17.616

COMFAR 2.1 UNI

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Income Statement in thousand USD

Year	2003	2004	2005	2006	2007
Total sales, incl. sales tax	241083.200	253137.300	265794.200	279083.900	293038.000
Less: variable costs, incl. sales tax.	157861.500	164041.500	170530.600	177344.100	184498.300
Variable margin	83221.700	89095.780	95263.560	101739.700	108539.700
As % of total sales	34.520	35.197	35.841	36.455	37.039
Non-variable costs, incl. depreciation	26293.590	23351.770	29973.160	23962.750	24817.470
Operational margin	56928.120	65744.020	65290.410	77776.980	83722.250
As % of total sales	23.613	25.972	24.564	27.869	28.570
Cost of finance	2473.334	0.000	0.000	0.000	0.000
Gross profit	54454.780	65744.020	65290.410	77776.980	83722.250
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	54454.780	65744.020	65290.410	77776.980	83722.250
Tax	29950.130	36159.210	35909.720	42777.340	46047.240
Net profit	24504.650	29584.810	29380.680	34999.640	37675.010
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	24504.650	29584.810	29380.680	34999.640	37675.010
Accumulated undistributed profit	54031.710	83616.520	112997.200	147996.800	185671.900
Gross profit, % of total sales	22.588	25.972	24.564	27.869	28.570
Net profit, % of total sales	10.164	11.687	11.054	12.541	12.857
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	16.582	18.005	17.675	20.942	22.297

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Net Income Statement in thousand USD

Year	2008	2009	2010	2011	2012
Total sales, incl. sales tax	307689.900	323074.400	339228.100	356189.500	373998.900
Less: variable costs, incl. sales tax.	192010.300	199897.800	208179.600	216875.600	226006.300
Variable margin	115679.700	123176.700	131048.500	139313.900	147992.600
As % of total sales	37.596	38.126	38.631	39.112	39.570
Non-variable costs, incl. depreciation	25714.910	26657.220	27646.630	28685.530	29500.530
Operational margin	89964.780	96519.470	103401.900	110628.300	118492.100
As % of total sales	29.239	29.875	30.482	31.059	31.682
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	89964.780	96519.470	103401.900	110628.300	118492.100
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	89964.780	96519.470	103401.900	110628.300	118492.100
Tax	49480.630	53085.710	56871.030	60845.590	65170.640
Net profit	40484.150	43433.760	46530.840	49782.750	53321.430
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	40484.150	43433.760	46530.840	49782.750	53321.430
Accumulated undistributed profit	226156.000	269589.800	316120.600	365903.400	419224.800
Gross profit, % of total sales	29.239	29.875	30.482	31.059	31.682
Net profit, % of total sales	13.157	13.444	13.717	13.976	14.257
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	23.688	25.115	26.578	28.077	29.679

Projected Balance Sheets, construction in thousand USD

Year	1995	1996	1997
Total assets	122000.000	122000.000	122000.000
Fixed assets, net of depreciation	0.000	13415.000	57230.000
Construction in progress	13415.000	43815.000	53860.000
Current assets	0.000	0.000	450.000
Cash, bank	0.000	0.000	0.000
Cash surplus, finance available	108585.000	64770.000	10460.000
Loss carried forward	0.000	0.000	0.000
Loss	0.000	0.000	0.000
Total liabilities	122000.000	122000.000	122000.000
Equity capital	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000
Profit	0.000	0.000	0.000
Long and medium term debt	122000.000	122000.000	122000.000
Current liabilities	0.000	0.000	0.000
Bank overdraft, finance required	0.000	0.000	0.000
Total debt	122000.000	122000.000	122000.000
Equity, % of liabilities	0.000	0.000	0.000

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

Year	1998	1999	2000	2001	2002
Total assets	144577.900	154497.000	158263.800	143937.200	138893.100
Fixed assets, net of depreciation	104796.900	108818.300	102029.700	95241.080	88452.480
Construction in progress	10810.000	0.000	0.000	0.000	0.000
Current assets	13903.630	22384.210	32929.240	40510.490	49872.090
Cash, bank	459.167	463.146	473.504	507.865	568.543
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	0.000	14608.240	22831.390	7677.738	0.000
Loss	14608.240	8223.150	0.000	0.000	0.000
Total liabilities	144577.900	154497.000	158263.800	143937.200	138893.100
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000	0.000	6783.674
Profit	0.000	0.000	15153.660	14461.410	22743.390
Long and medium term debt	122000.000	95916.670	69833.340	43750.000	17666.670
Current liabilities	2741.342	4767.567	7333.533	9179.552	11401.190
Bank overdraft, finance required	19836.550	53812.760	65943.270	76546.190	80298.200
Total debt	144577.900	154497.000	143110.100	129475.700	109366.100
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

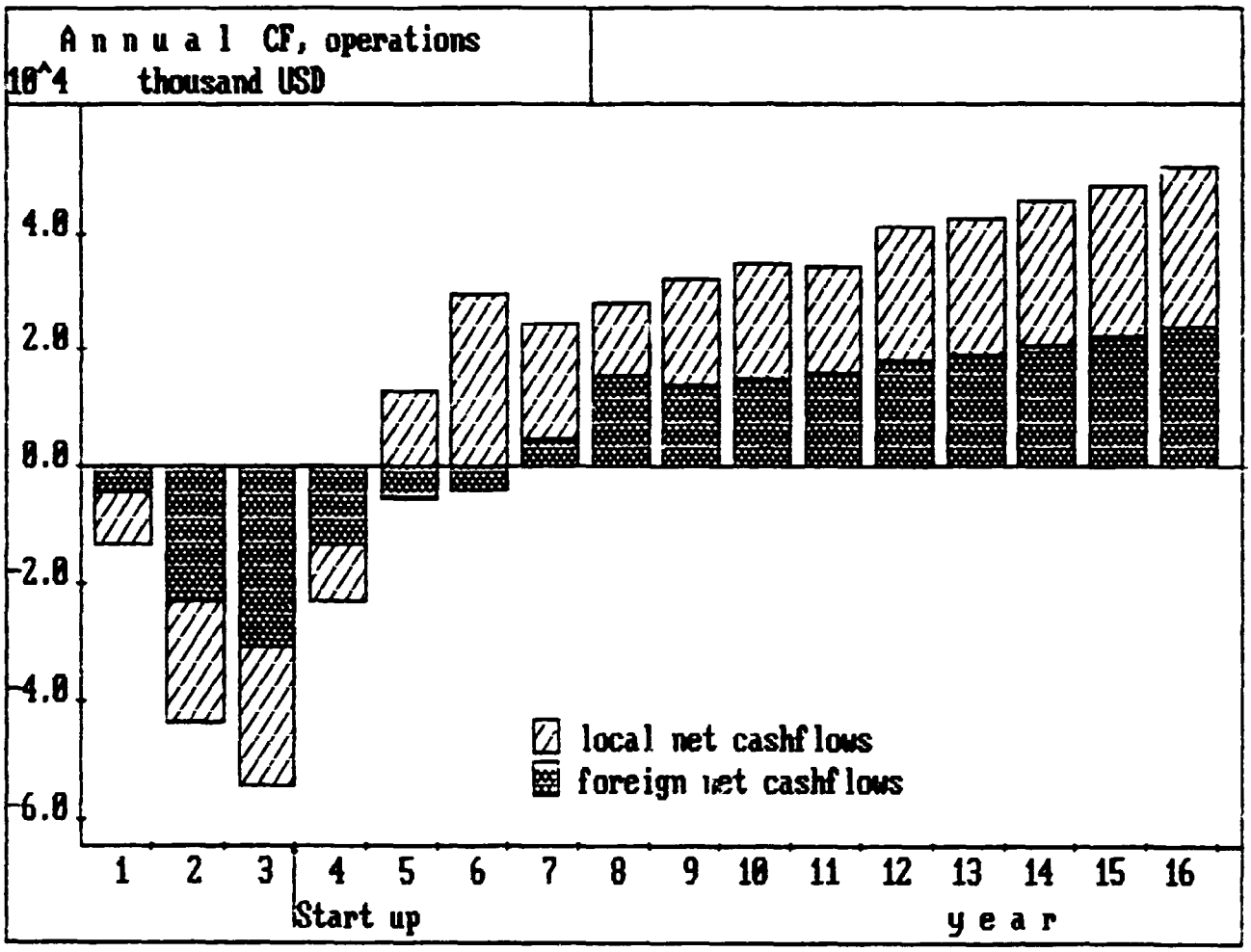
COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

Year	2003	2004	2005	2006	2007
Total assets	134726.800	129801.800	129872.300	164909.500	203221.000
Fixed assets, net of depreciation	81663.890	74875.300	68086.700	61298.110	54509.520
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	52295.920	54284.380	56987.920	58179.750	60625.440
Cash, bank	766.975	642.112	915.603	662.648	695.613
Cash surplus, finance available	0.000	0.000	3882.102	44768.960	87390.410
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	134726.800	129801.800	129872.300	164909.500	203221.000
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	29527.060	54031.710	83616.520	112997.200	147996.800
Profit	24504.650	29584.810	29380.680	34999.640	37675.010
Long and medium term debt	8833.339	0.003	0.003	0.003	0.003
Current liabilities	12267.460	12510.620	13575.130	13612.620	14249.130
Bank overdraft, finance required	59594.270	33674.650	3300.000	3300.000	3300.000
Total debt	80695.060	46185.270	16875.130	16912.630	17549.130
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

Projected Balance Sheets, Production in thousand USD

Year	2008	2009	2010	2011	2012
Total assets	244373.500	288509.000	335776.700	386333.100	440466.900
Fixed assets, net of depreciation	47720.930	40932.340	34143.750	27355.160	20842.430
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	63193.410	65889.790	68720.980	71693.740	74815.130
Cash, bank	730.228	766.572	804.734	844.804	886.878
Cash surplus, finance available	132728.900	180920.300	232107.200	286439.400	343922.400
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	244373.500	288509.000	335776.700	386333.100	440466.900
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	185671.900	226156.000	269589.800	316120.600	365903.400
Profit	40484.150	43433.760	46530.840	49782.750	53321.430
Long and medium term debt	0.003	0.003	0.003	0.003	0.003
Current liabilities	14917.460	15619.210	16356.040	17129.710	17942.070
Bank overdraft, finance required	3300.000	3300.000	3300.000	3300.000	3300.000
Total debt	18217.460	18919.210	19656.040	20429.720	21242.080
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000


A n n u a l CF, operations
10^4 thousand USD
4.0
2.0
0.0
-2.0
-4.0
-6.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
y e a r

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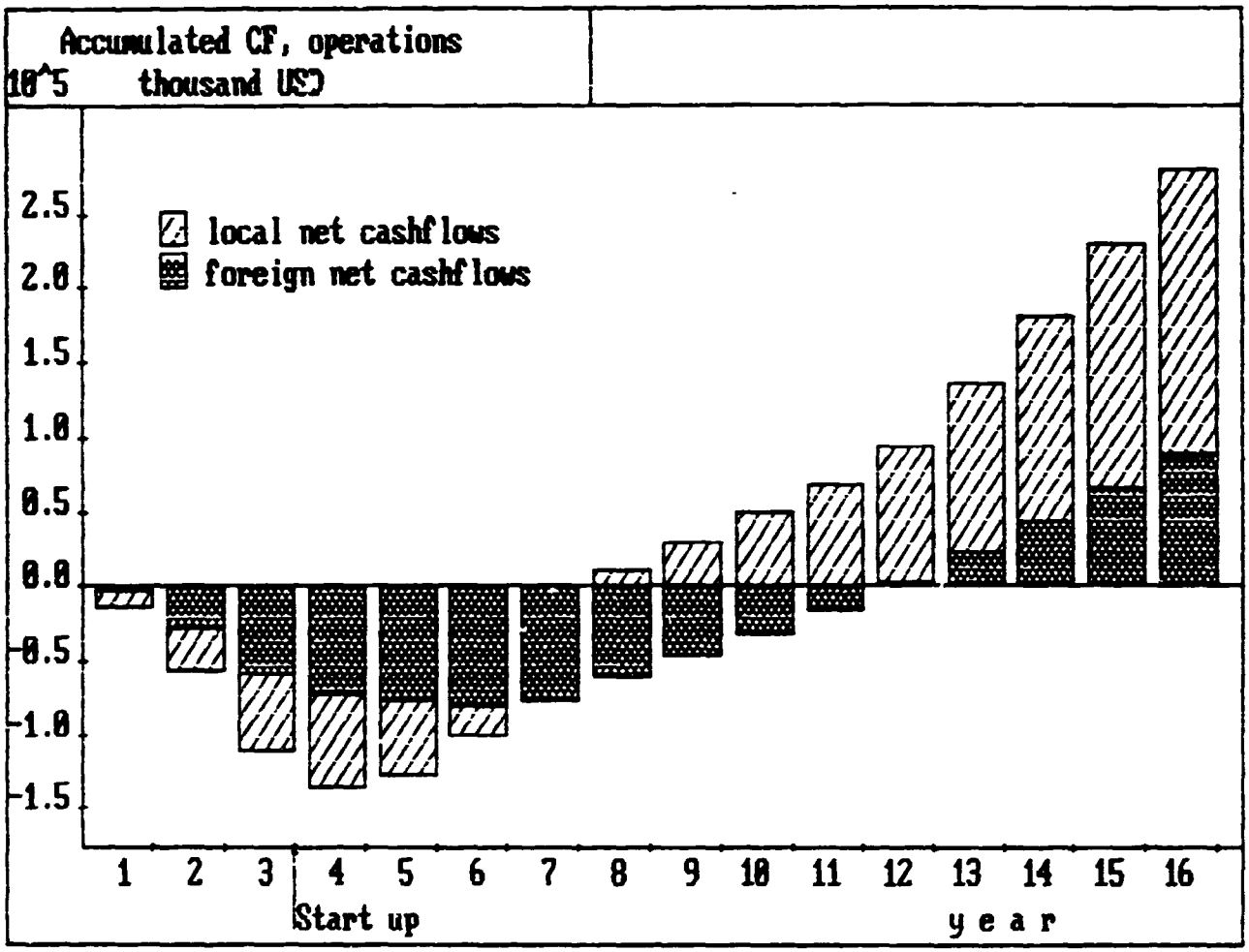
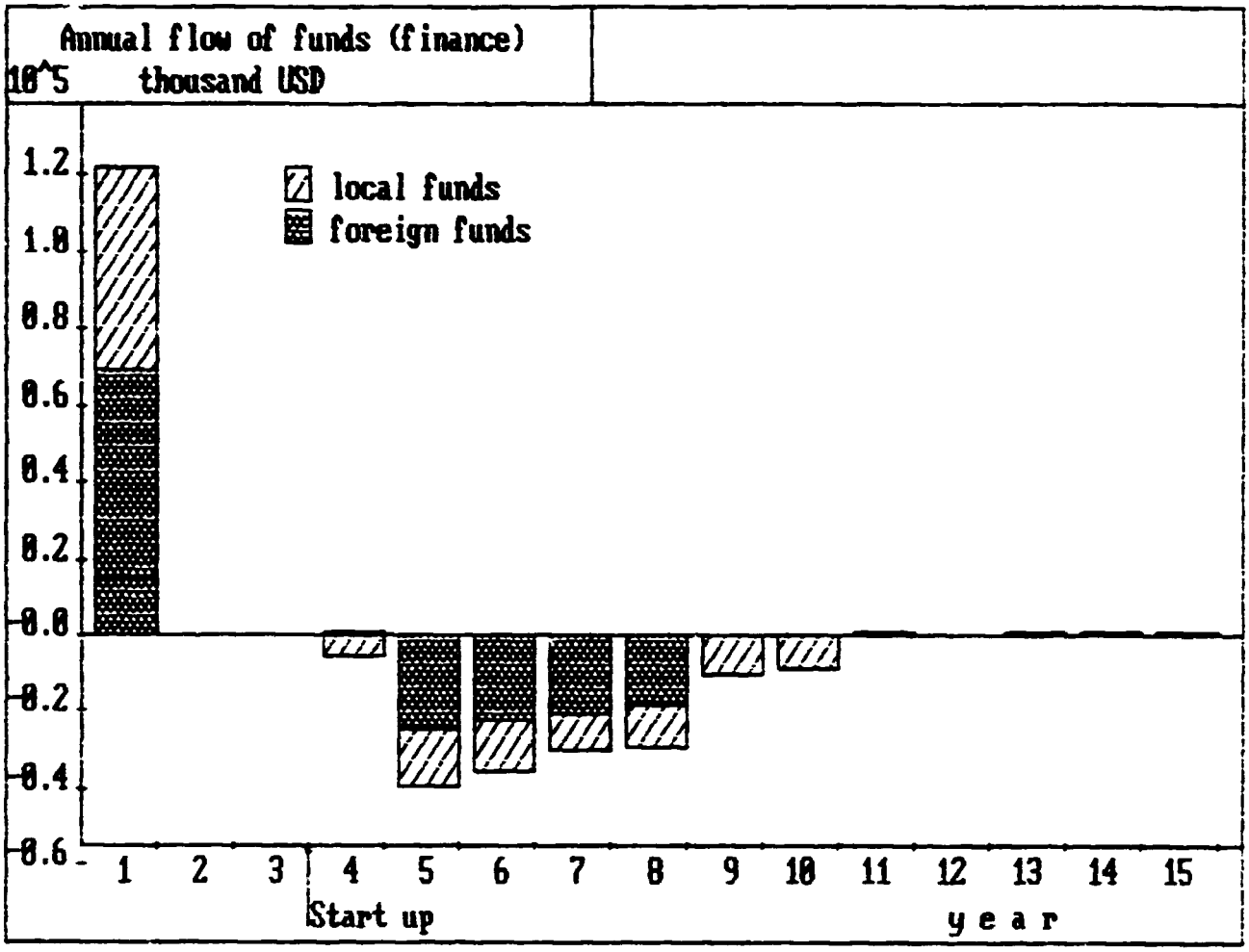
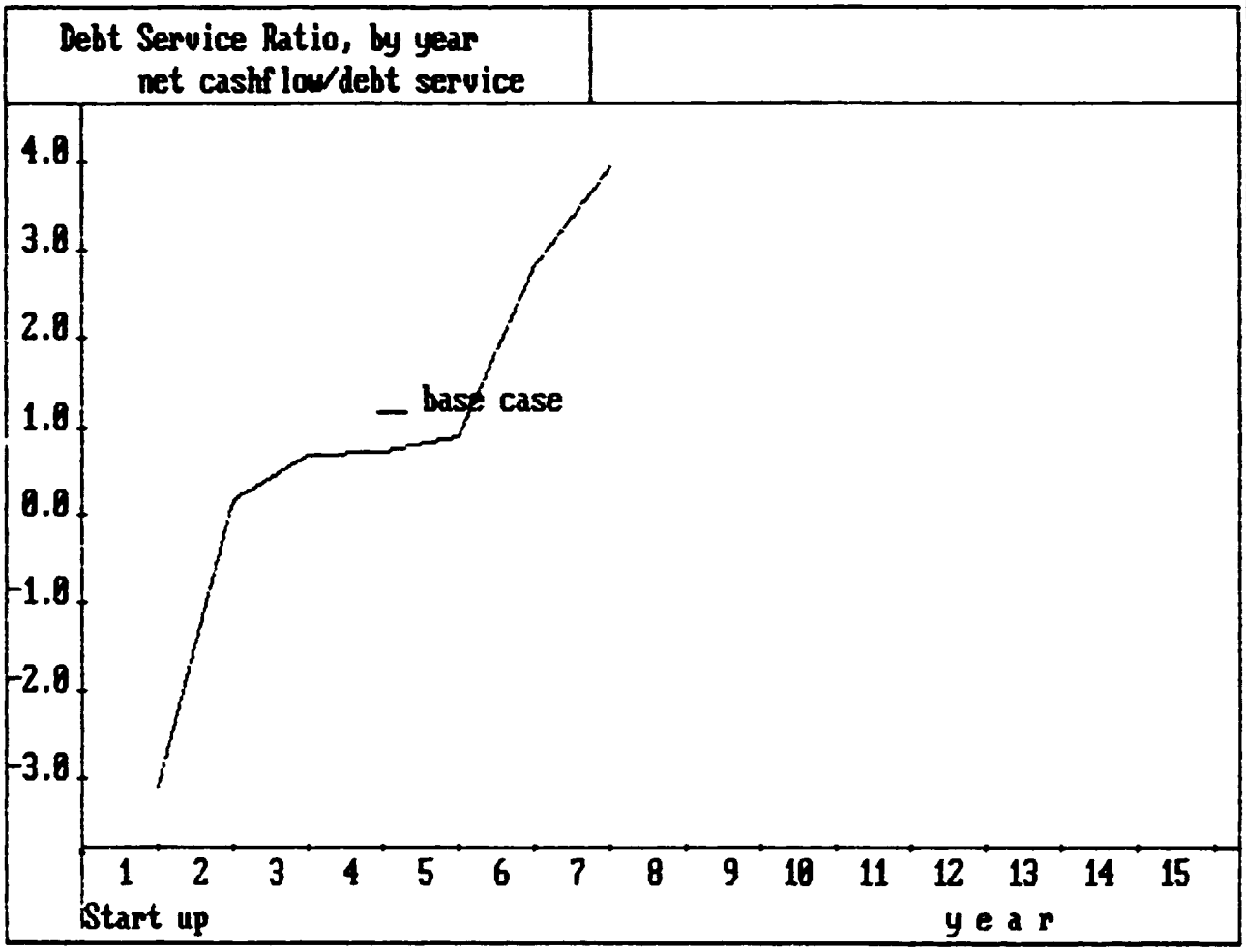
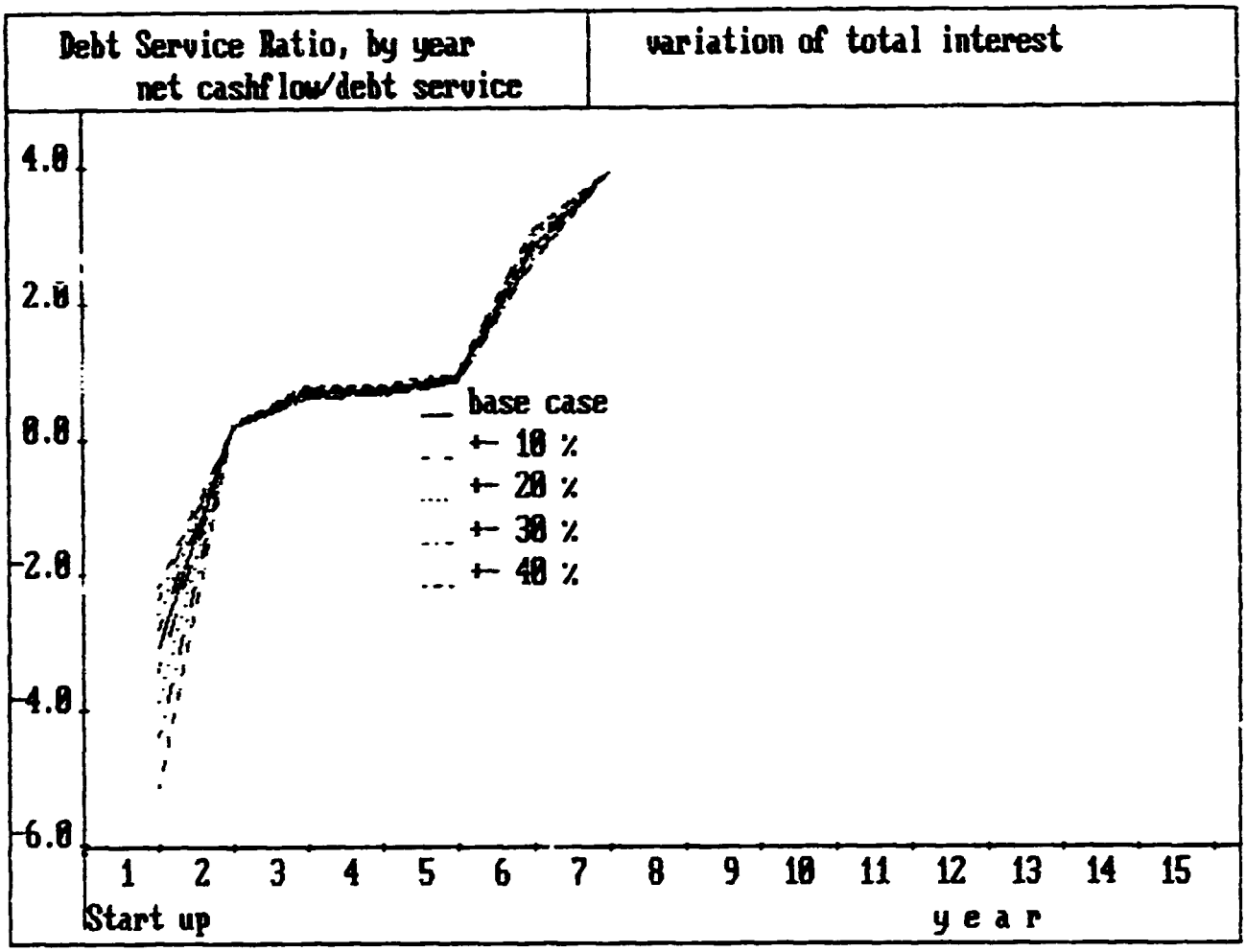
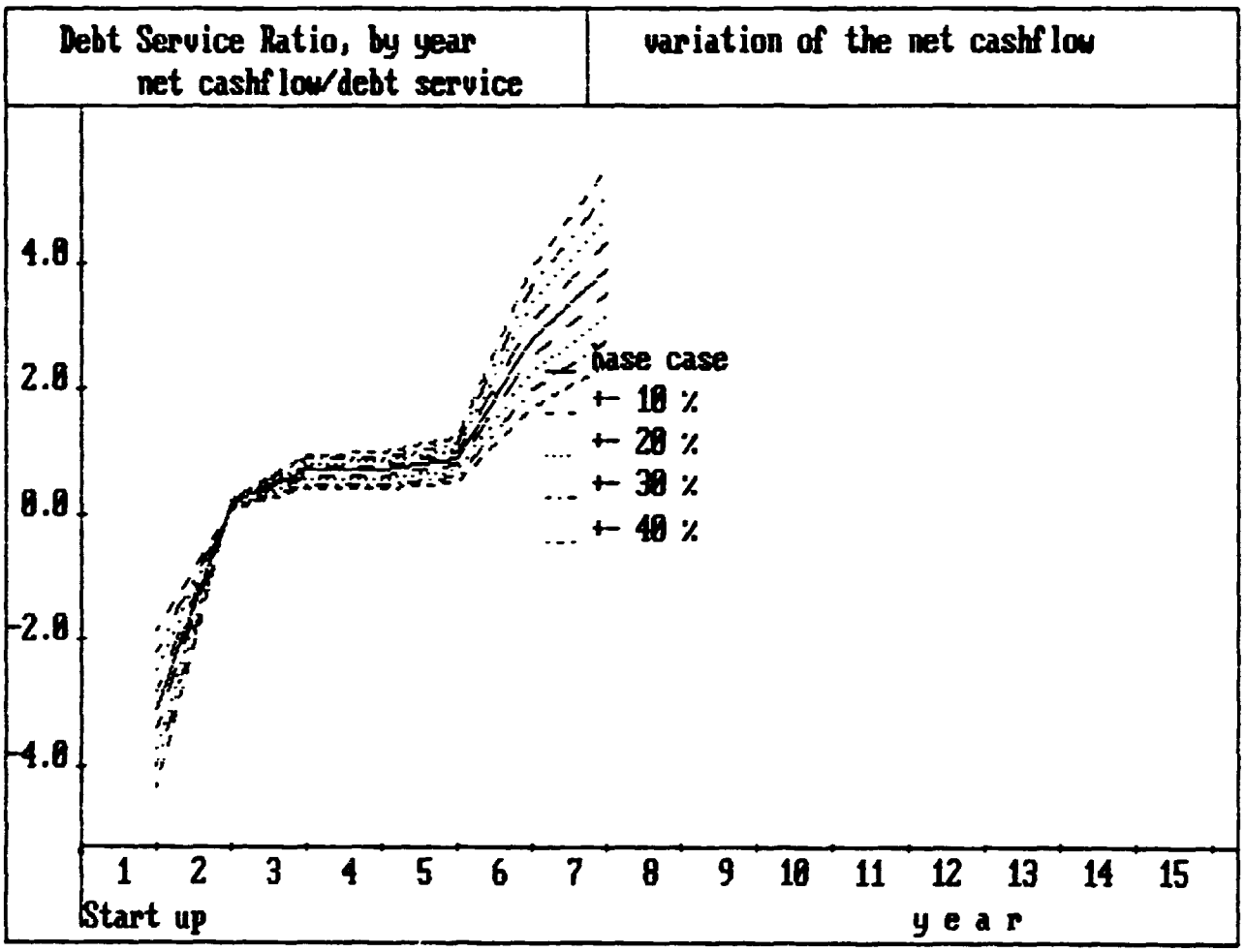

Accumulated CF, operations
10^5 thousand USD
local net cashflows
foreign net cashflows
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year

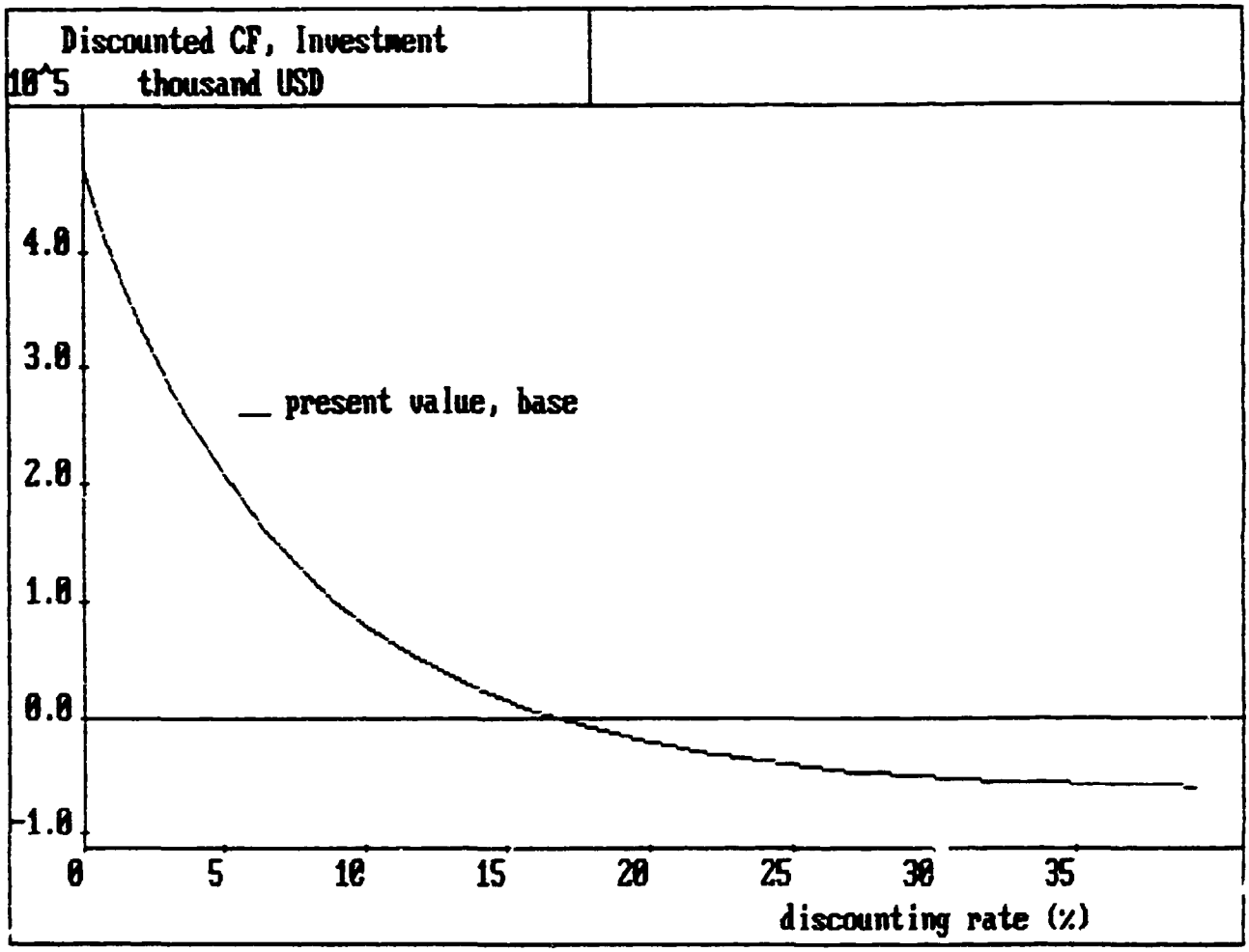

Annual flow of funds (finance)
10^5 thousand USD
local funds
foreign funds
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

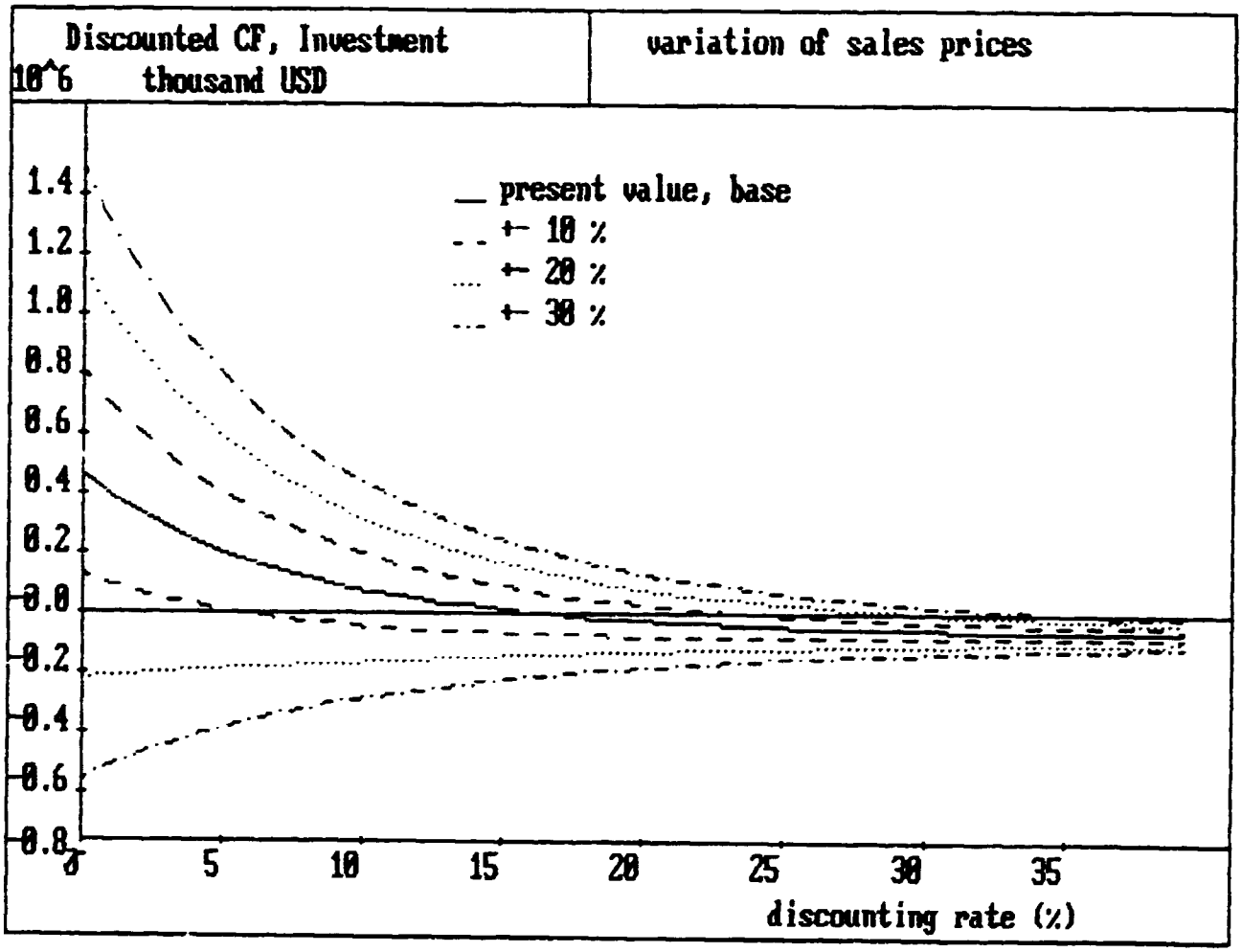

Debt Service Ratio, by year
net cashflow/debt service
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

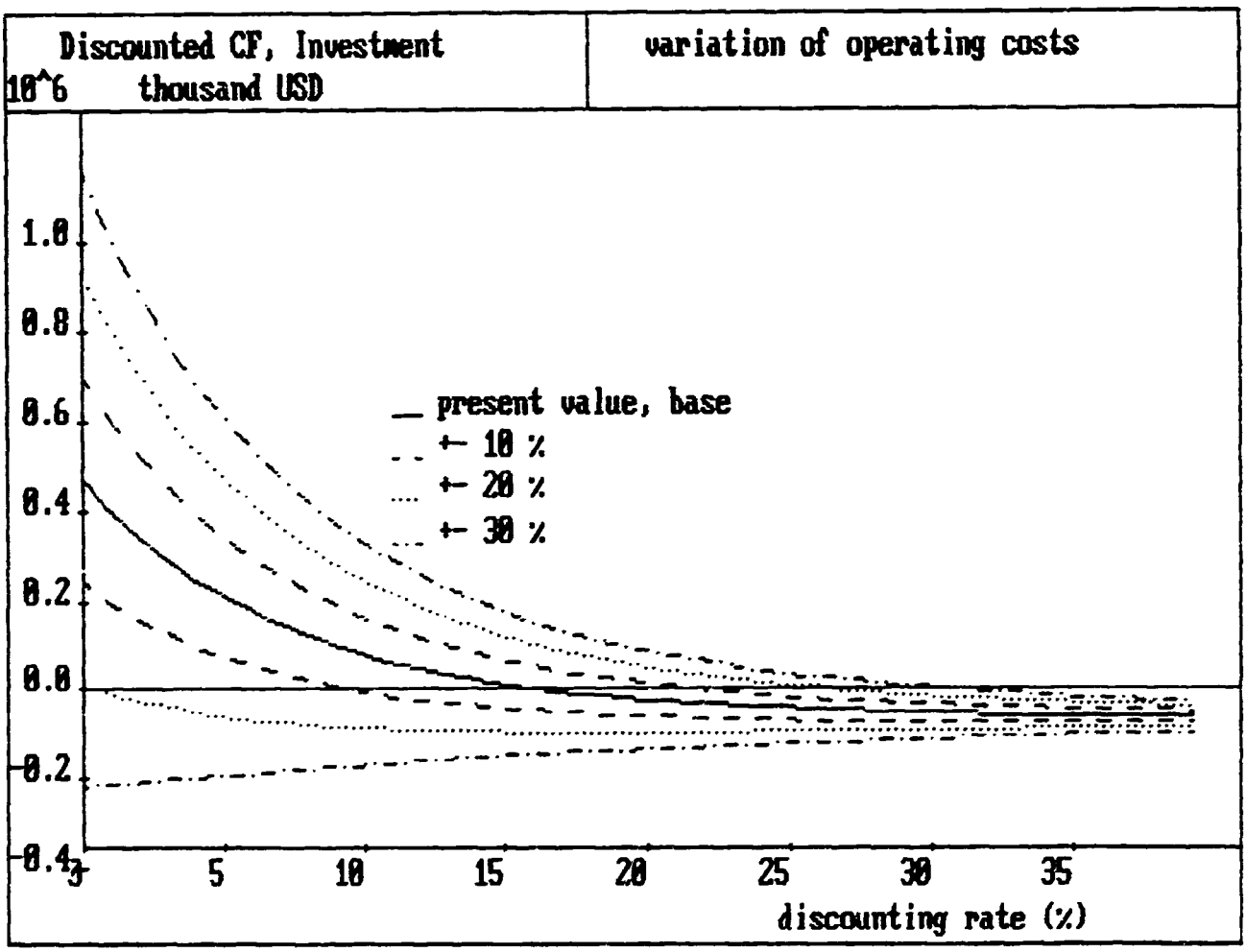
COMFA UNIC

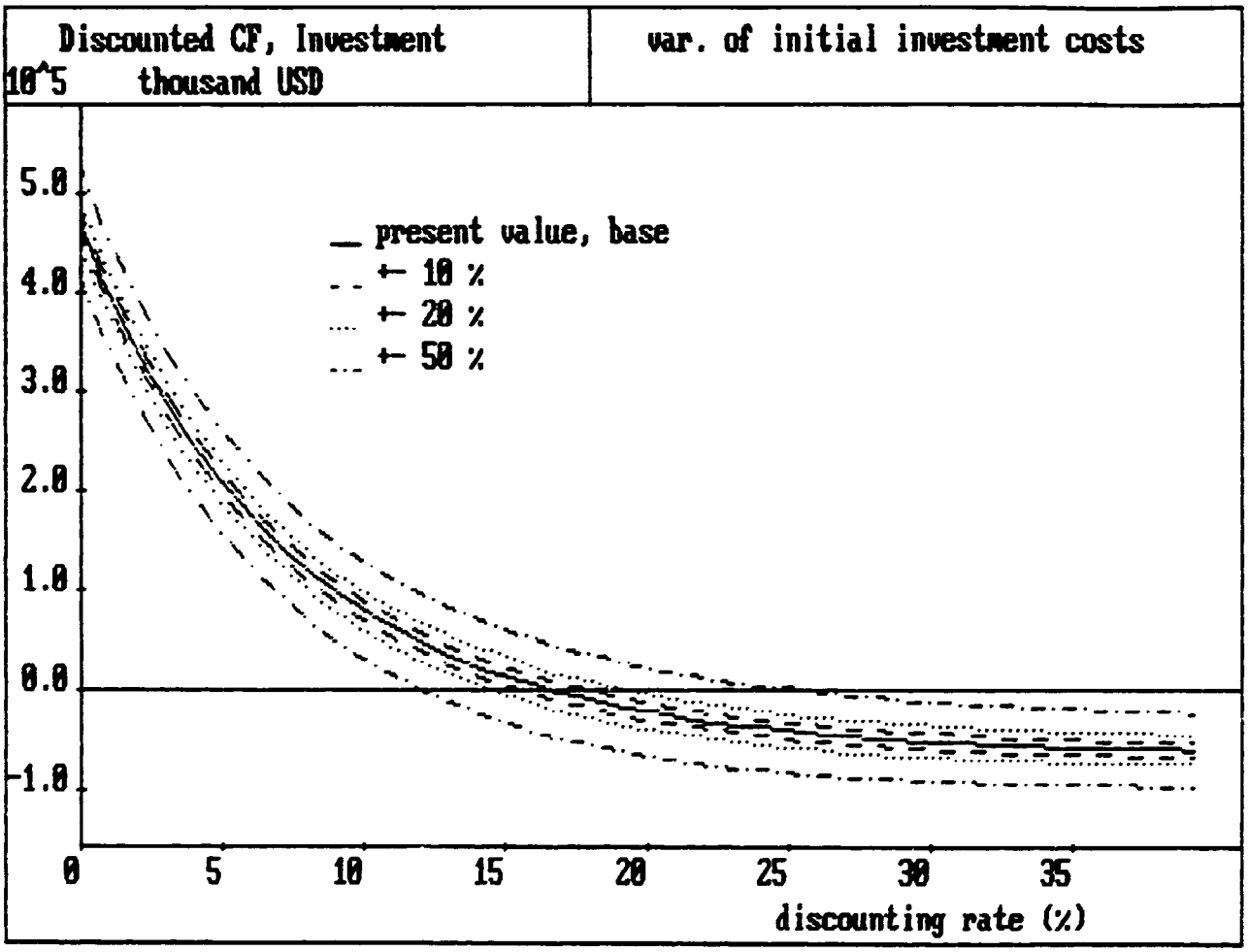

Debt Service Ratio, by year
net cashflow/debt service
variation of total interest
4.0
2.0
0.0
-2.0
-4.0
-6.0
base case
+- 10 %
+- 20 %
+- 30 %
+- 40 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

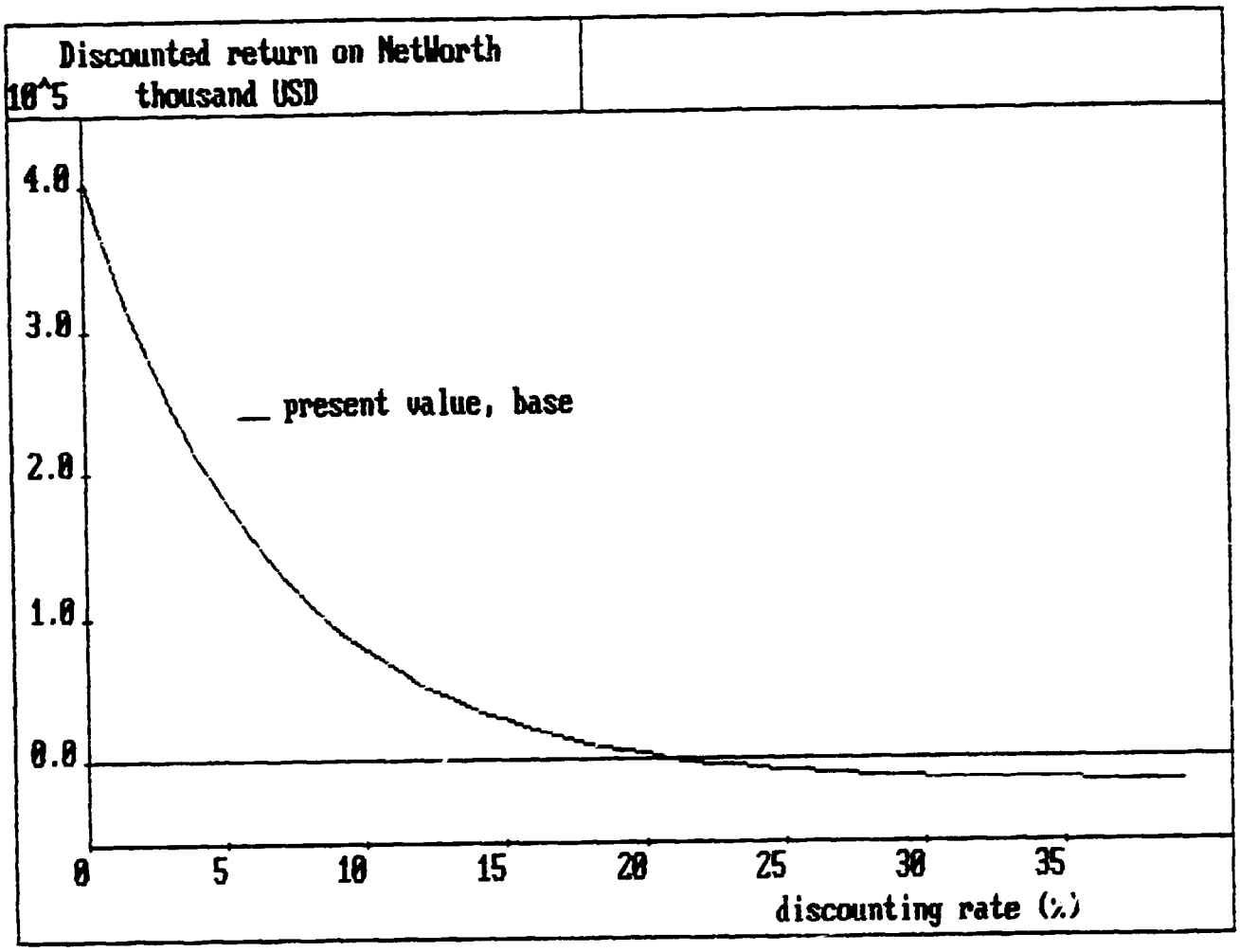

Debt Service Ratio, by year
net cashflow/debt service
variation of the net cashflow
4.0
2.0
0.0
-2.0
-4.0
base case
+- 10 %
+- 20 %
+- 30 %
+- 40 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

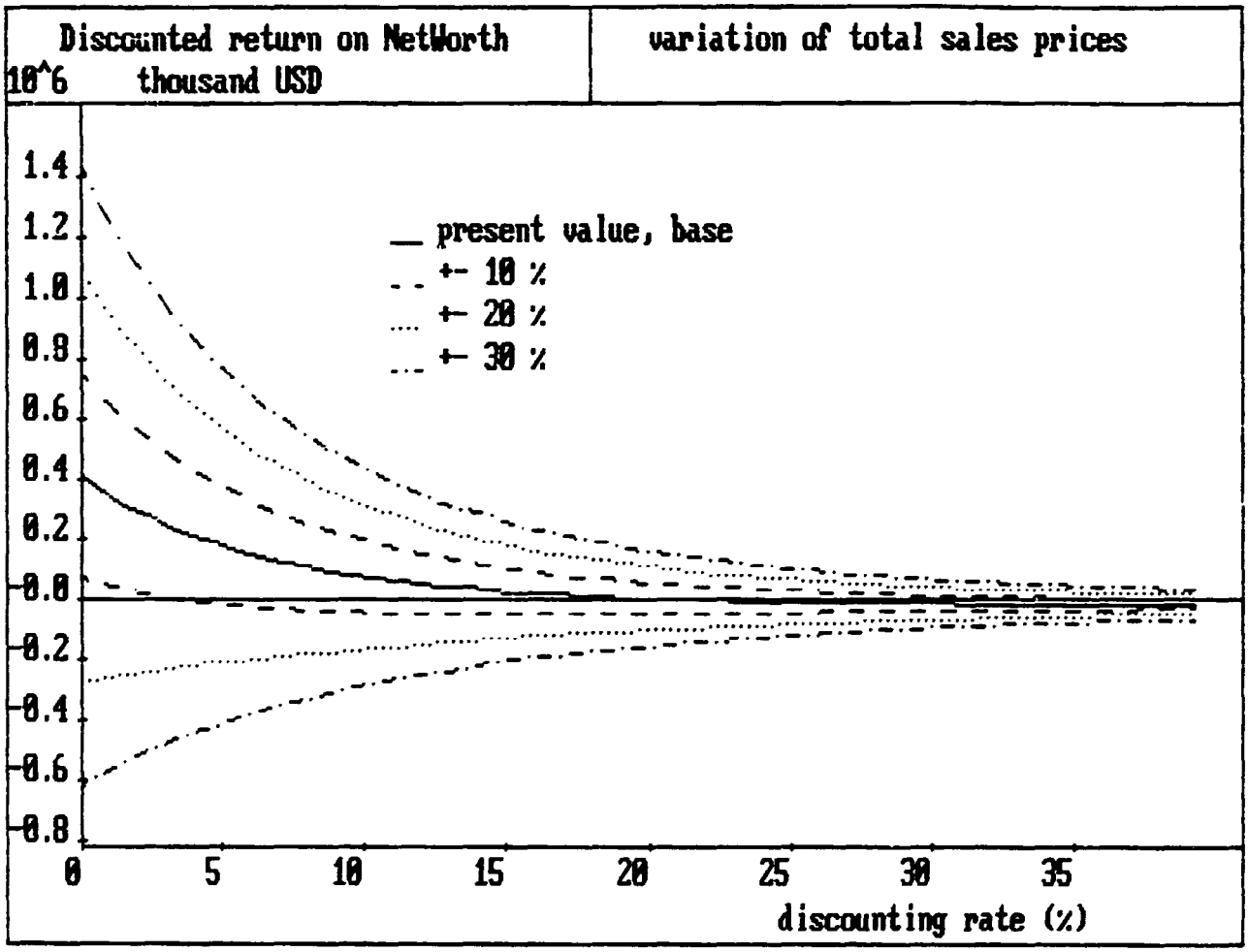

Discounted CF, Investment
10^5 thousand USD
4.0
3.0
2.0
1.0
0.0
-1.0
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

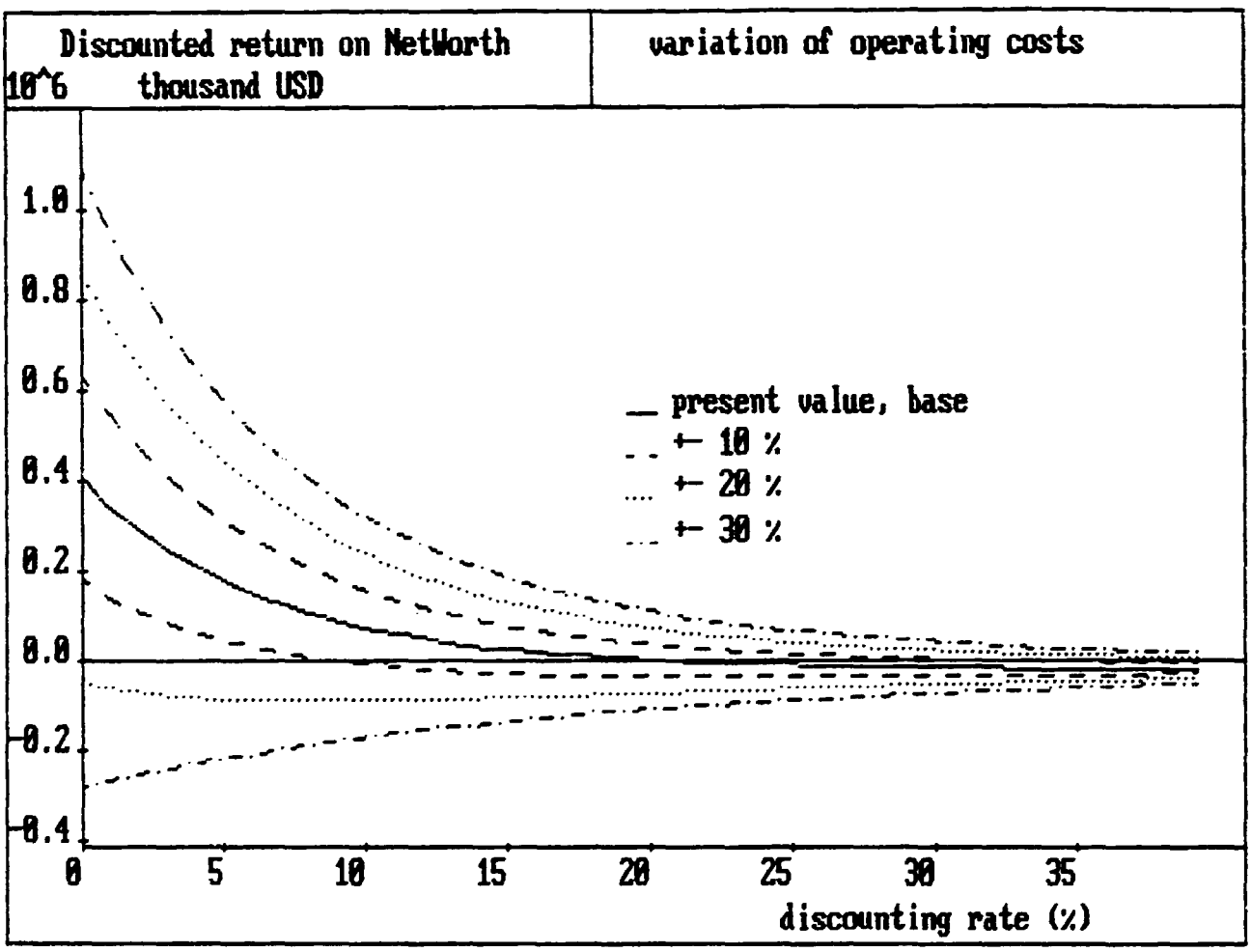

Discounted CF, Investment
10^6 thousand USD
variation of sales prices
present value, base
+- 10 %
+- 20 %
+- 30 %
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
0
5
10
15
20
25
30
35
discounting rate (%)

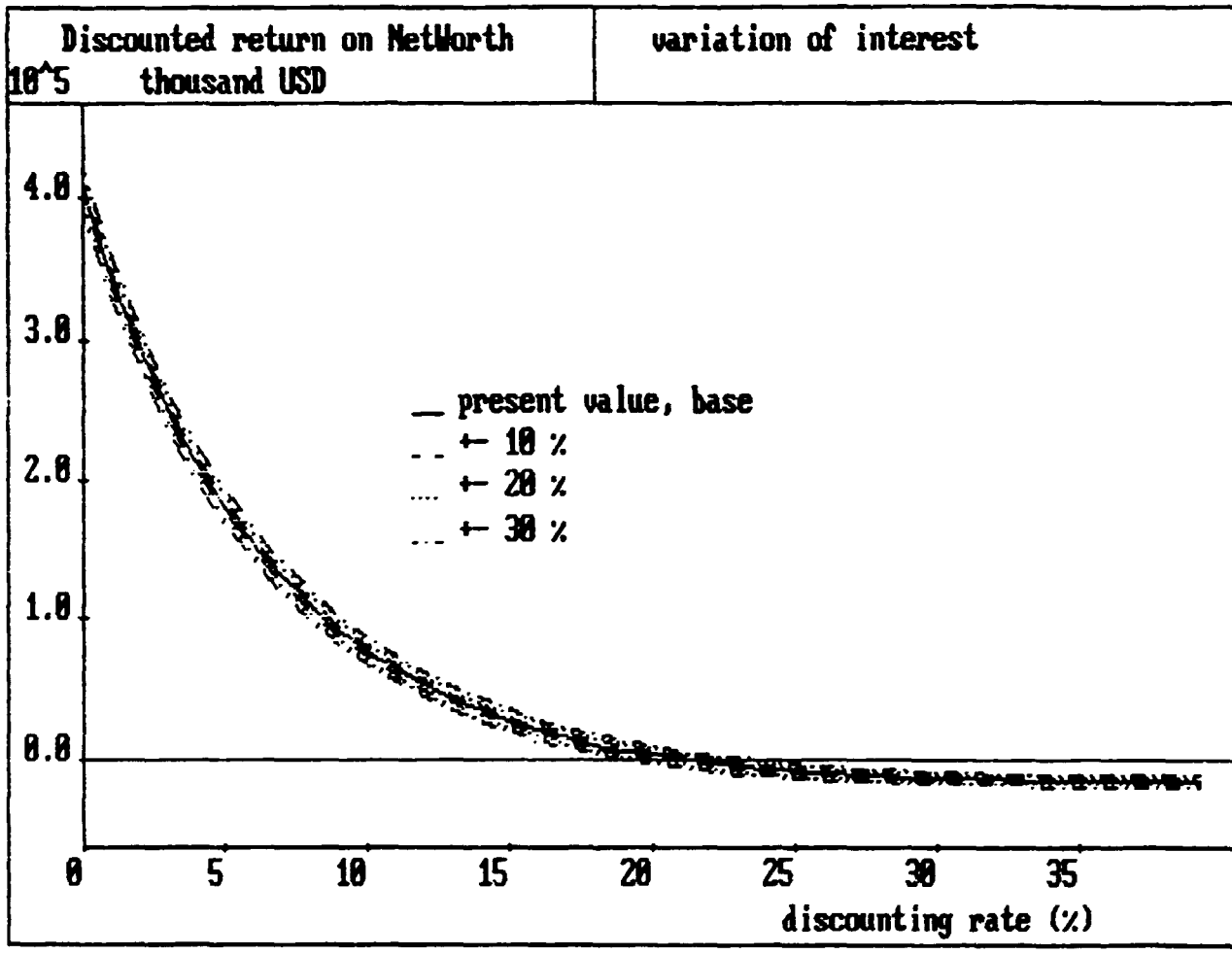

Discounted CF, Investment
variation of operating costs
10^6 thousand USD
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
present value, base
+- 10 %
+- 20 %
+- 30 %
0
5
10
15
20
25
30
35
discounting rate (%)

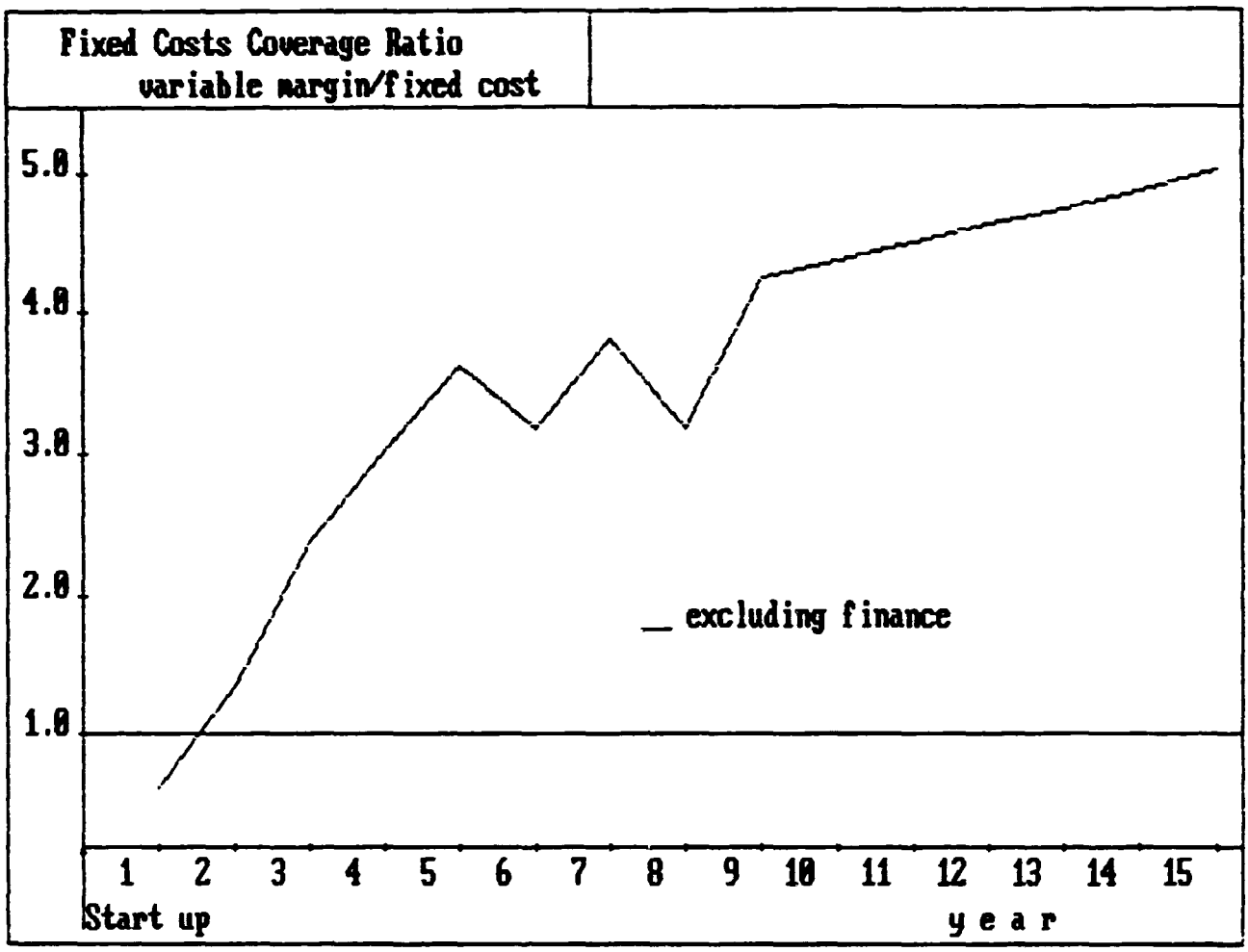

Discounted CF, Investment
10^5 thousand USD
var. of initial investment costs
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
present value, base
+- 10 %
+- 20 %
+- 50 %
0
5
10
15
20
25
30
35
discounting rate (%)

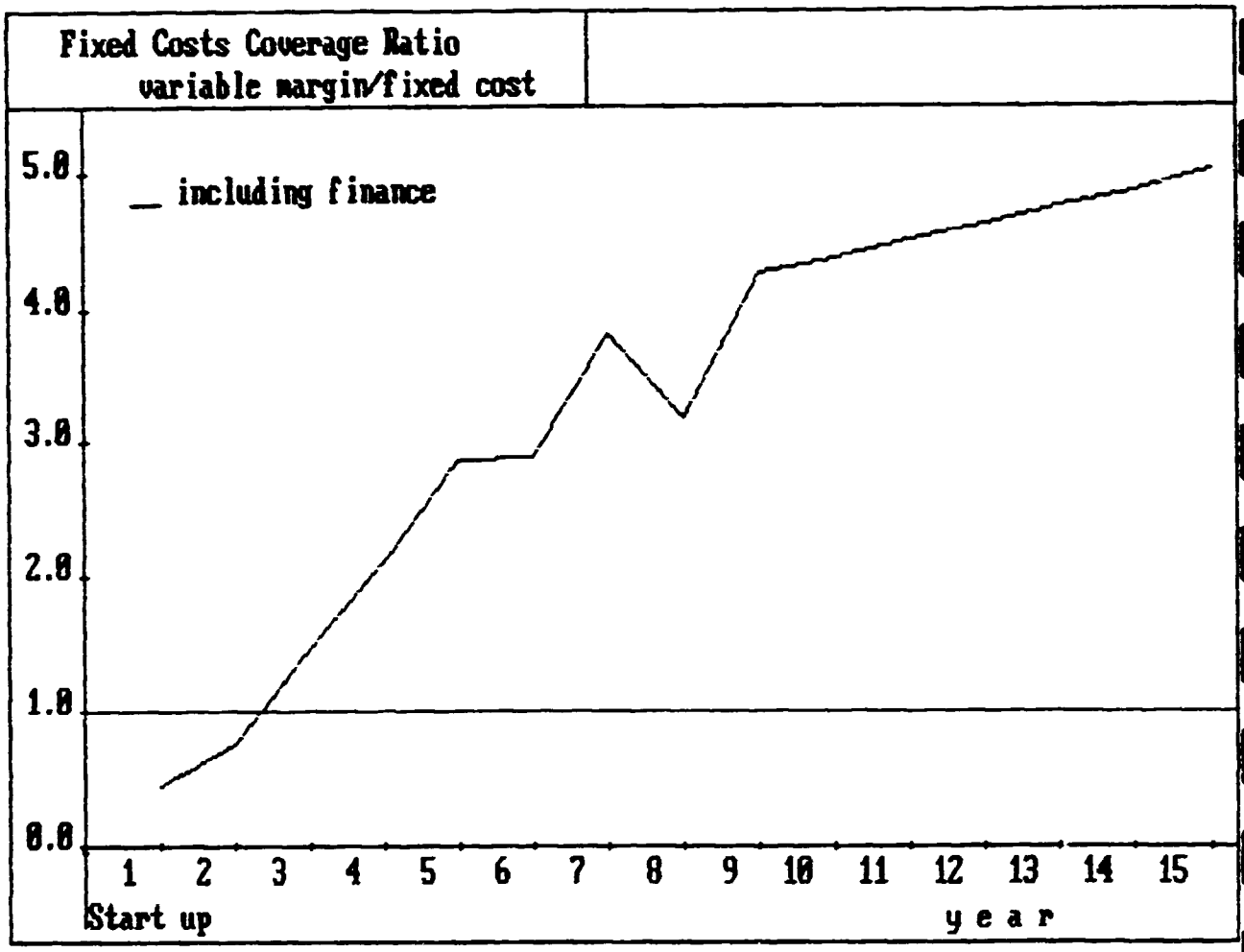

Discounted return on NetWorth
10^5 thousand USD
4.0
3.0
2.0
1.0
0.0
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

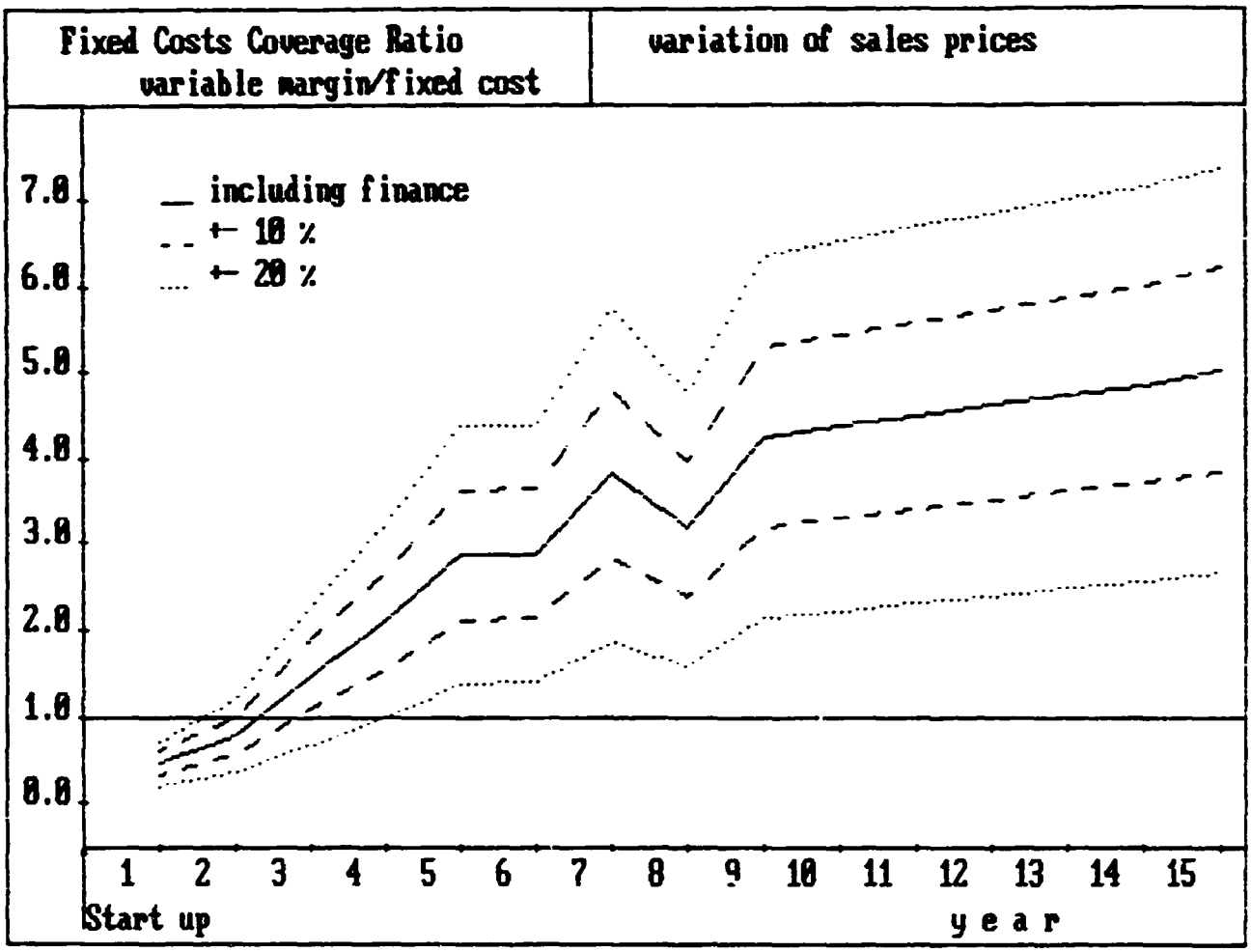

Discounted return on NetWorth
10^6 thousand USD
variation of total sales prices
present value, base
+- 10 %
+- 20 %
+- 30 %
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-0.0
-0.2
-0.4
-0.6
-0.8
0
5
10
15
20
25
30
35
discounting rate (%)

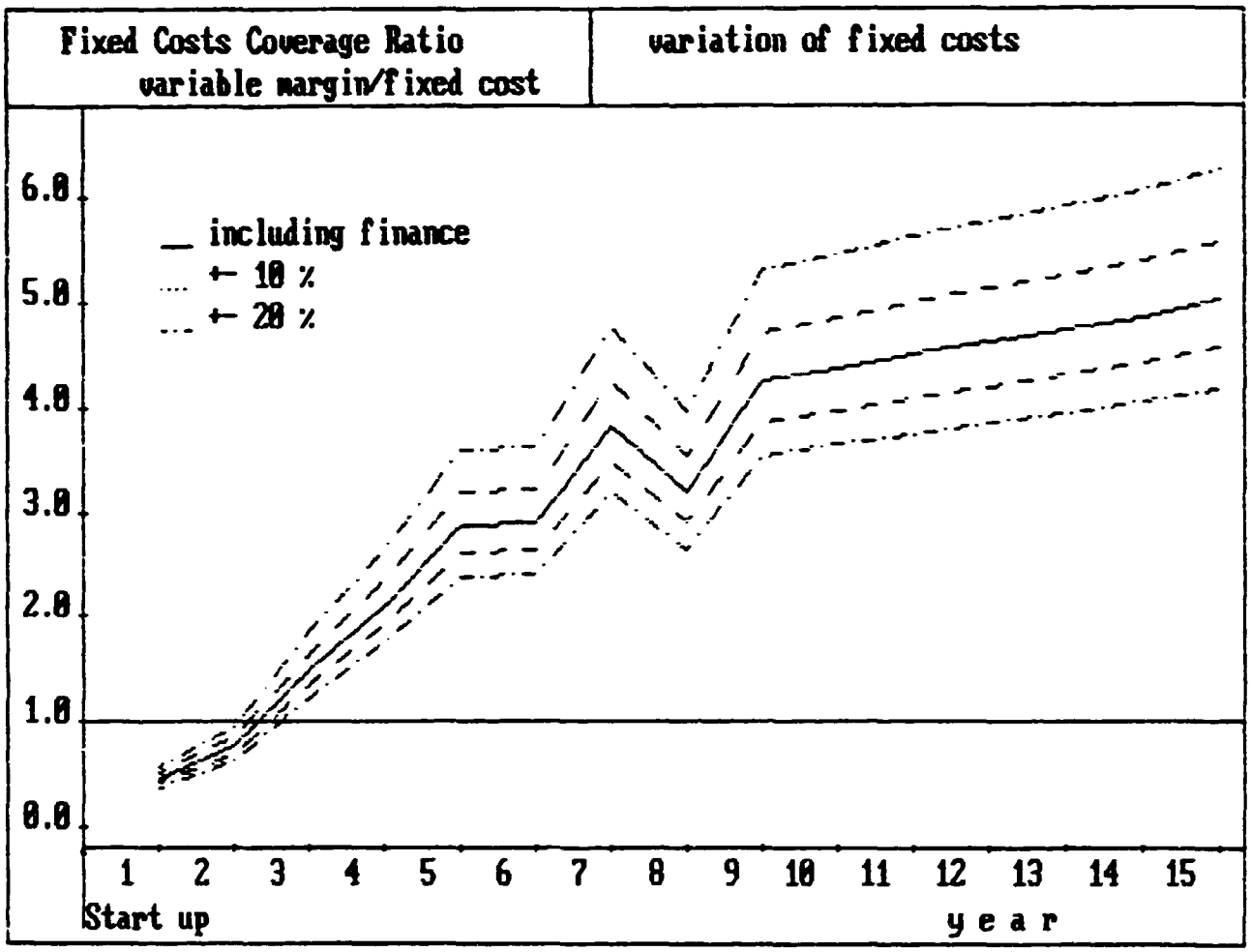

Discounted return on NetWorth
10^6 thousand USD
variation of operating costs
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
present value, base
+- 10 %
+- 20 %
+- 30 %
0
5
10
15
20
25
30
35
discounting rate (%)

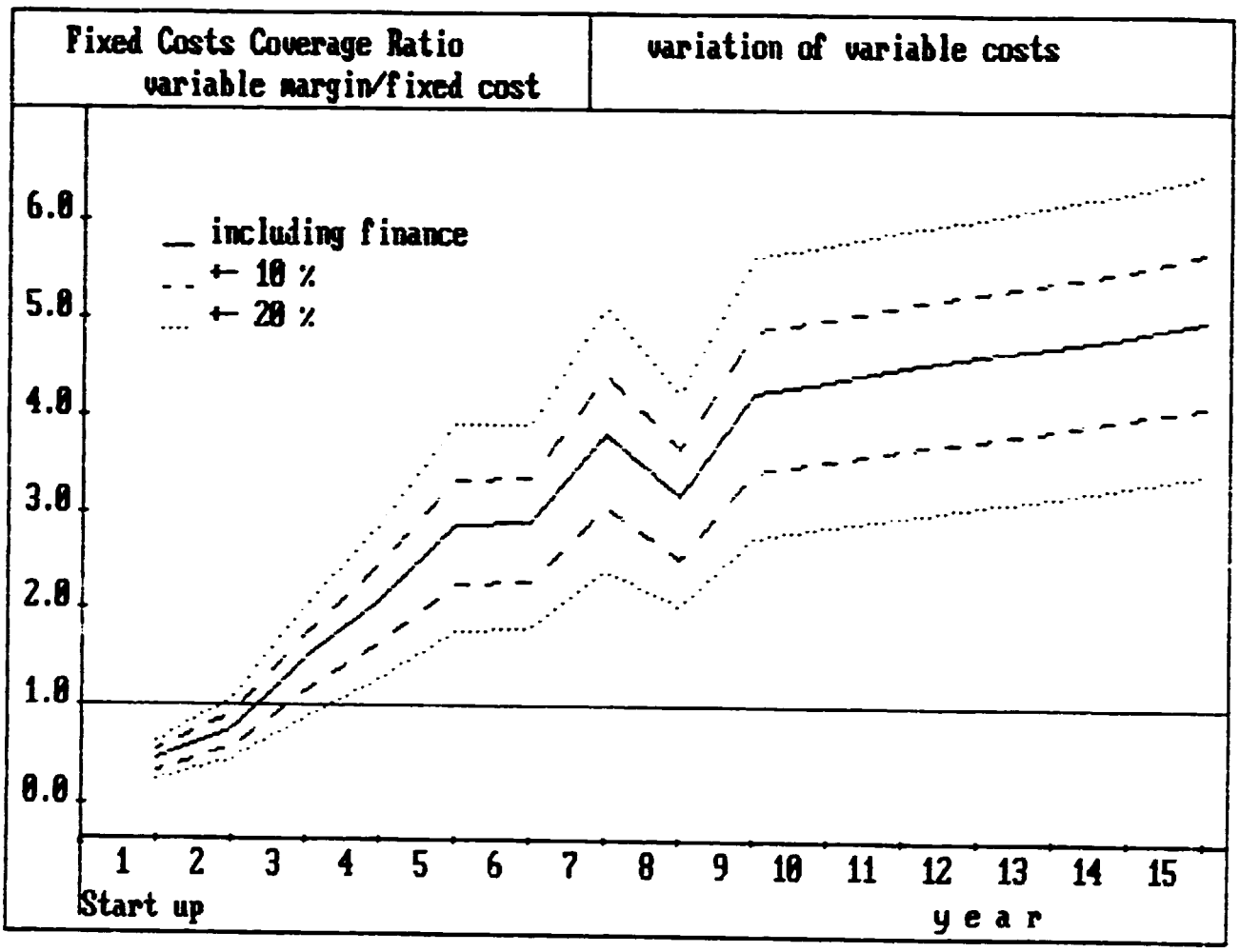

Discounted return on NetWorth
10^5 thousand USD
variation of interest
4.0
3.0
2.0
1.0
0.0
present value, base
← 10 %
← 20 %
← 30 %
0
5
10
15
20
25
30
35
discounting rate (%)


Fixed Costs Coverage Ratio
variable margin/fixed cost
5.0
4.0
3.0
2.0
1.0
excluding finance
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
5.0
4.0
3.0
2.0
1.0
0.0
_ including finance
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of sales prices
including finance
+- 10 %
+- 20 %
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of fixed costs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
including finance
← 10 %
← 20 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of variable costs
6.0
5.0
4.0
3.0
2.0
1.0
0.0
including finance
← 10 %
← 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year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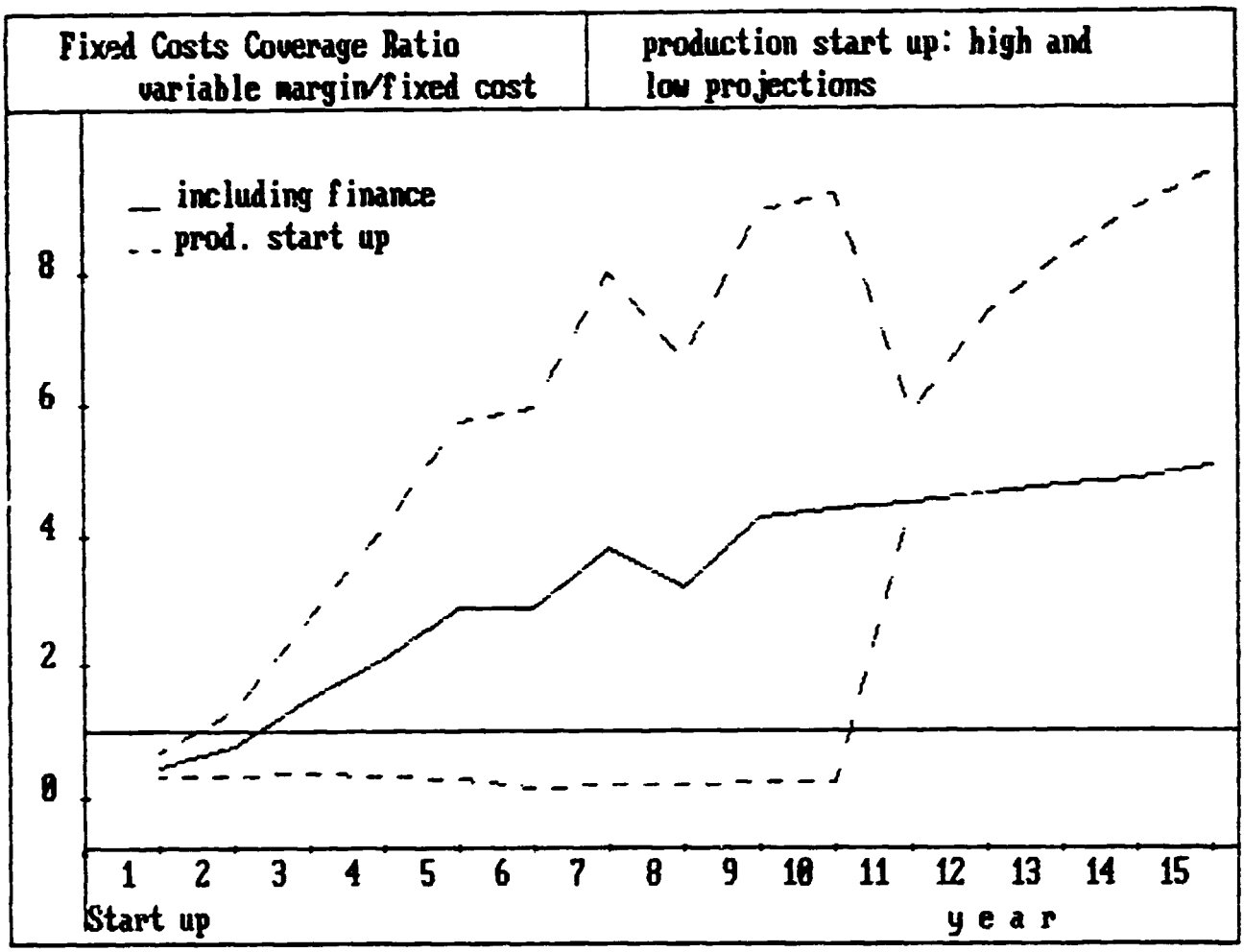
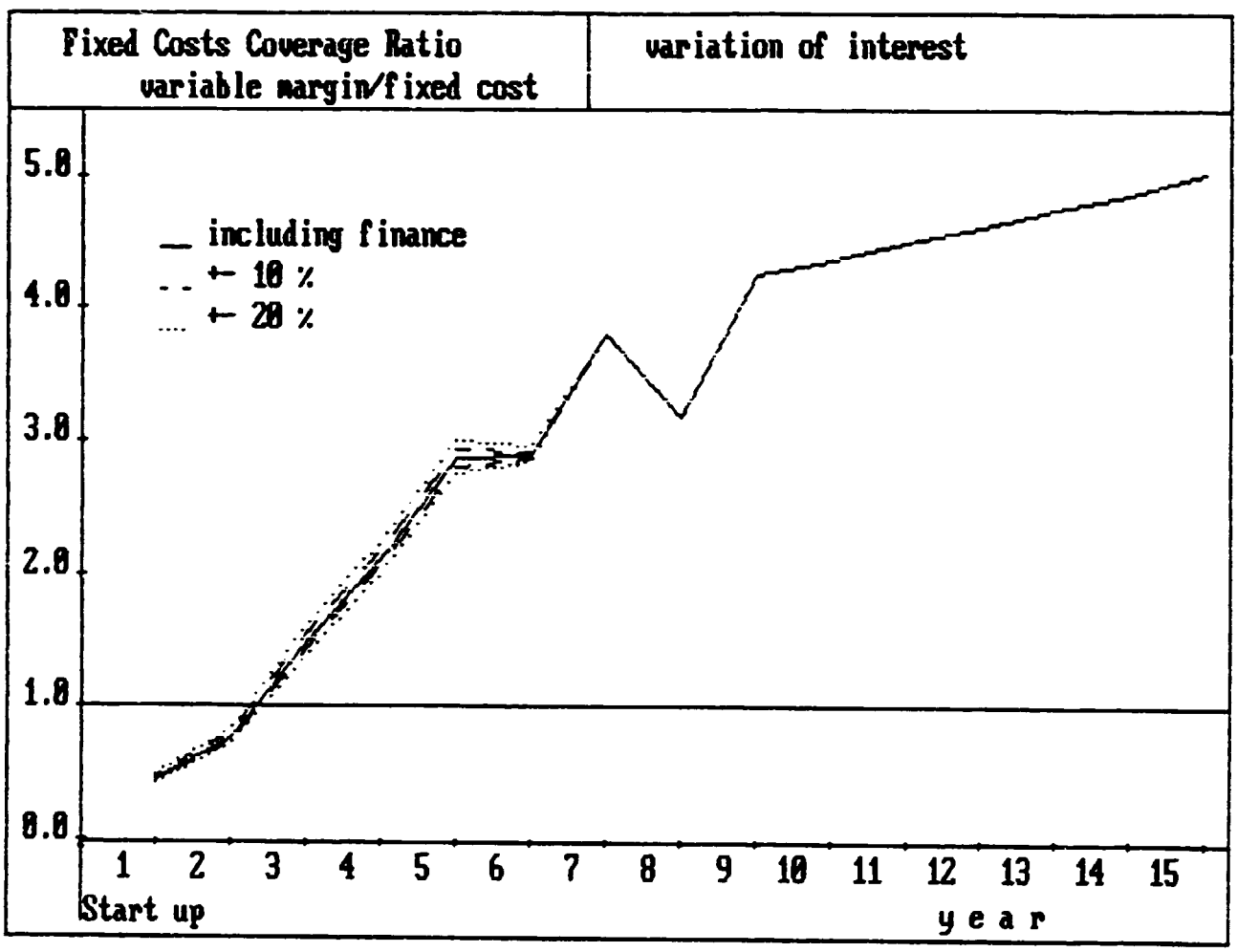
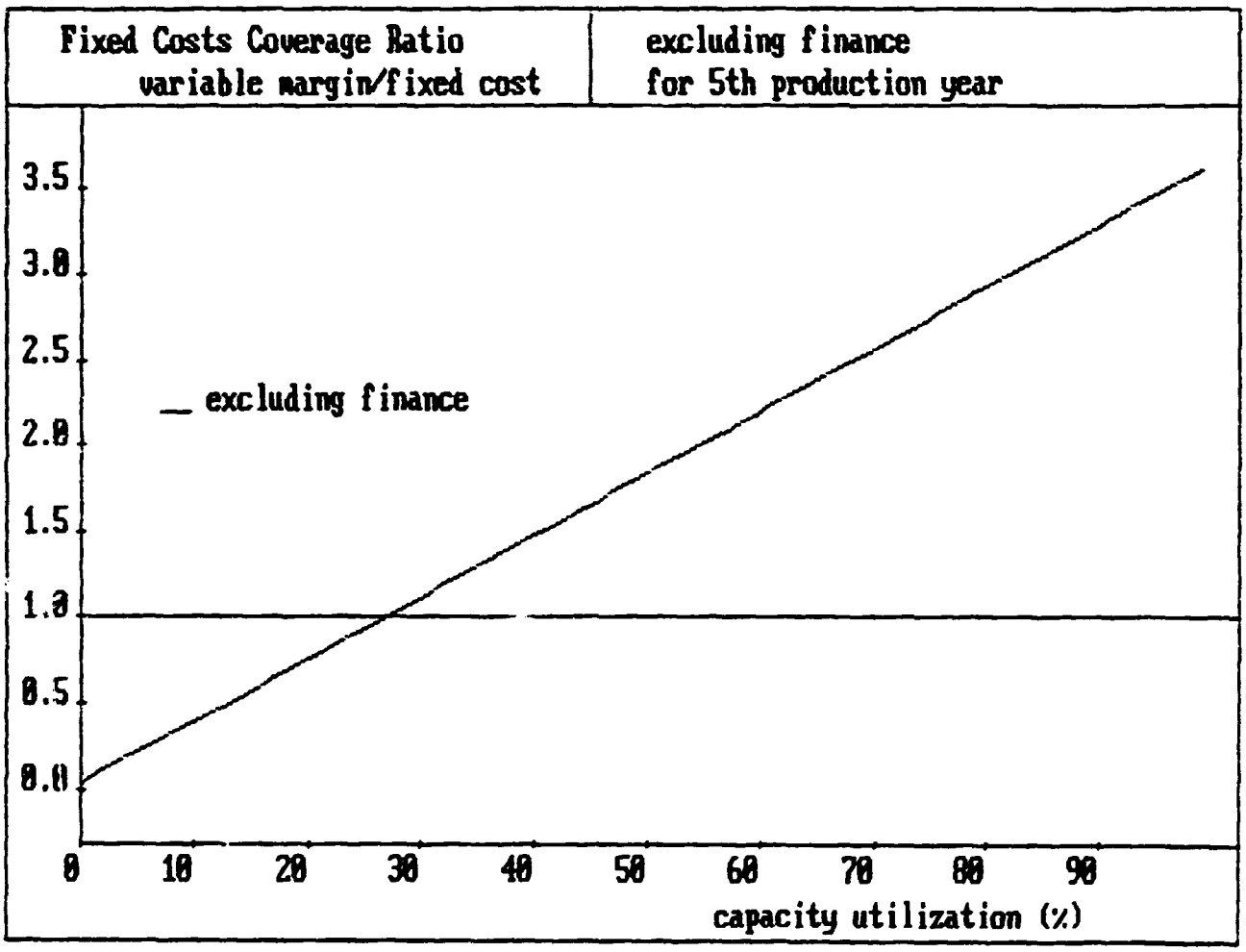
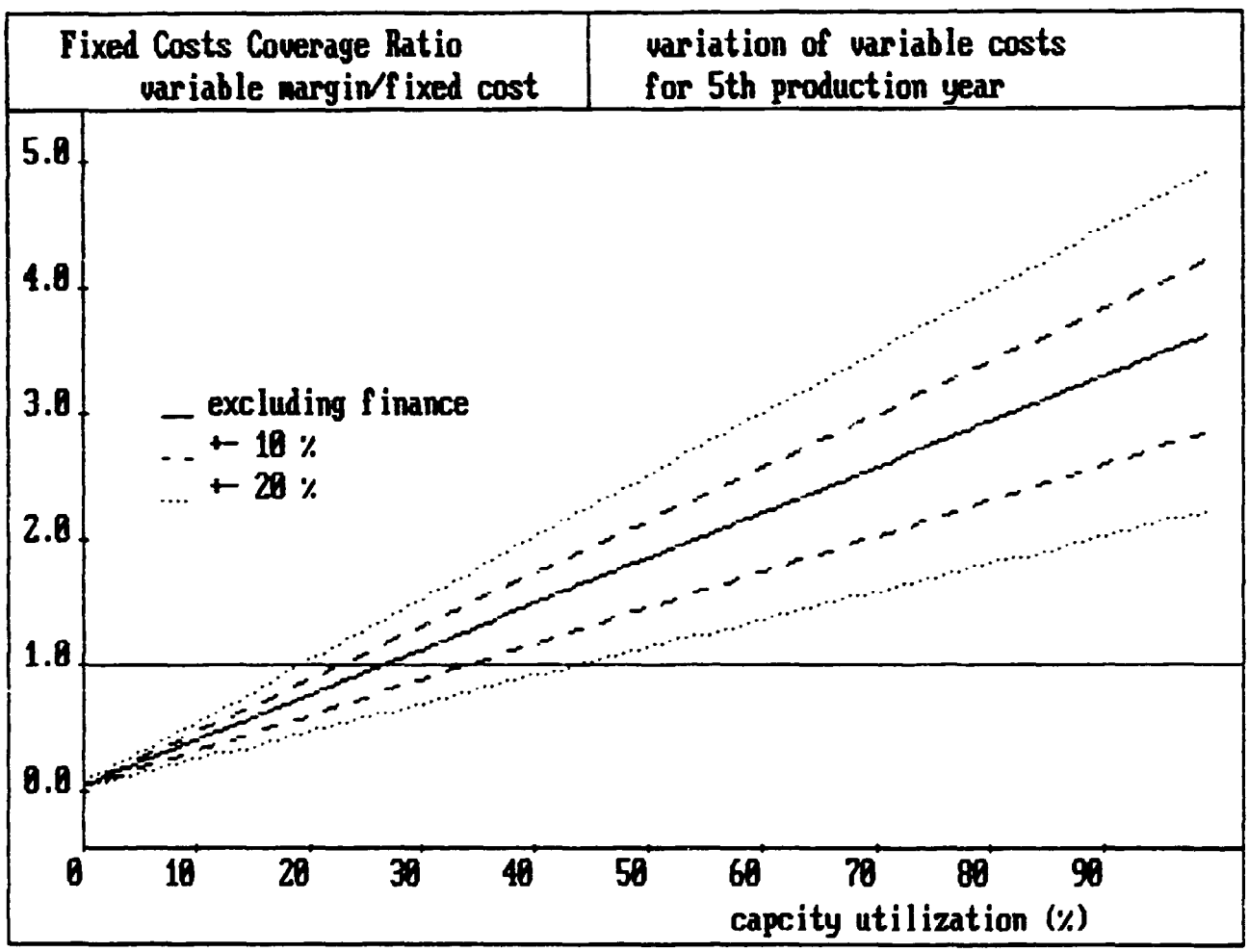
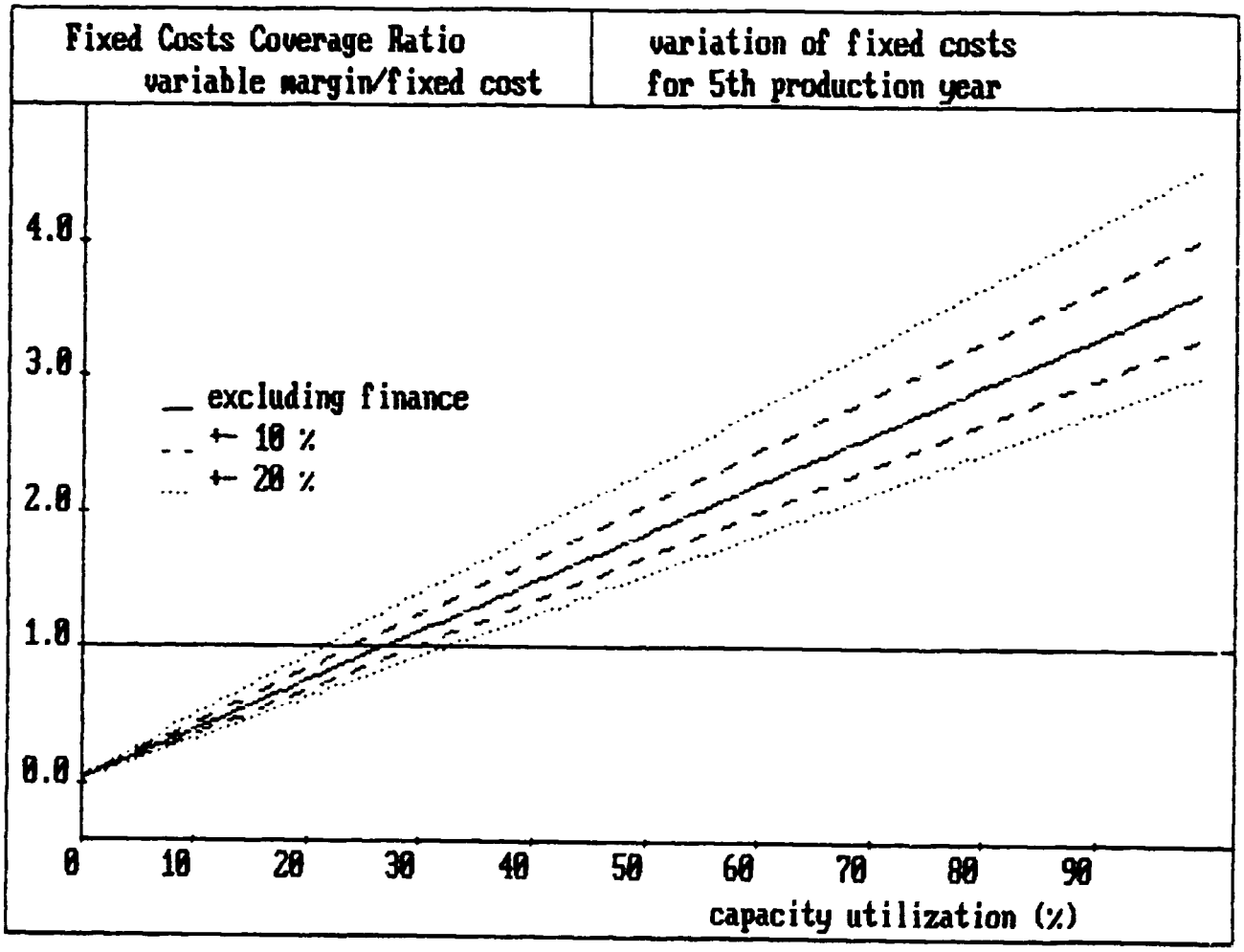
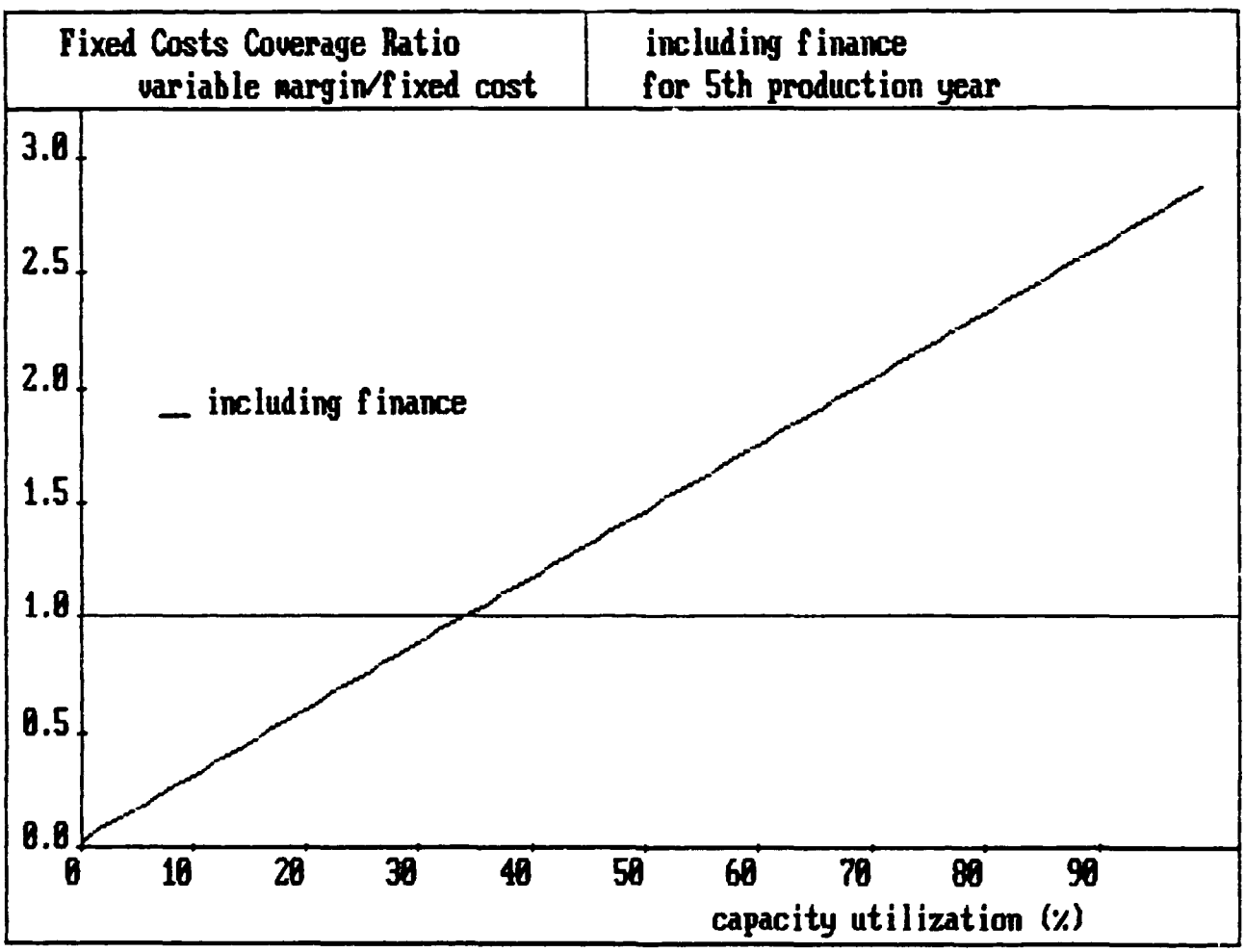

Fixed Costs Coverage Ratio
variable margin/fixed cost
production start up: high and
low projections
__ including finance
.. prod. start up
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

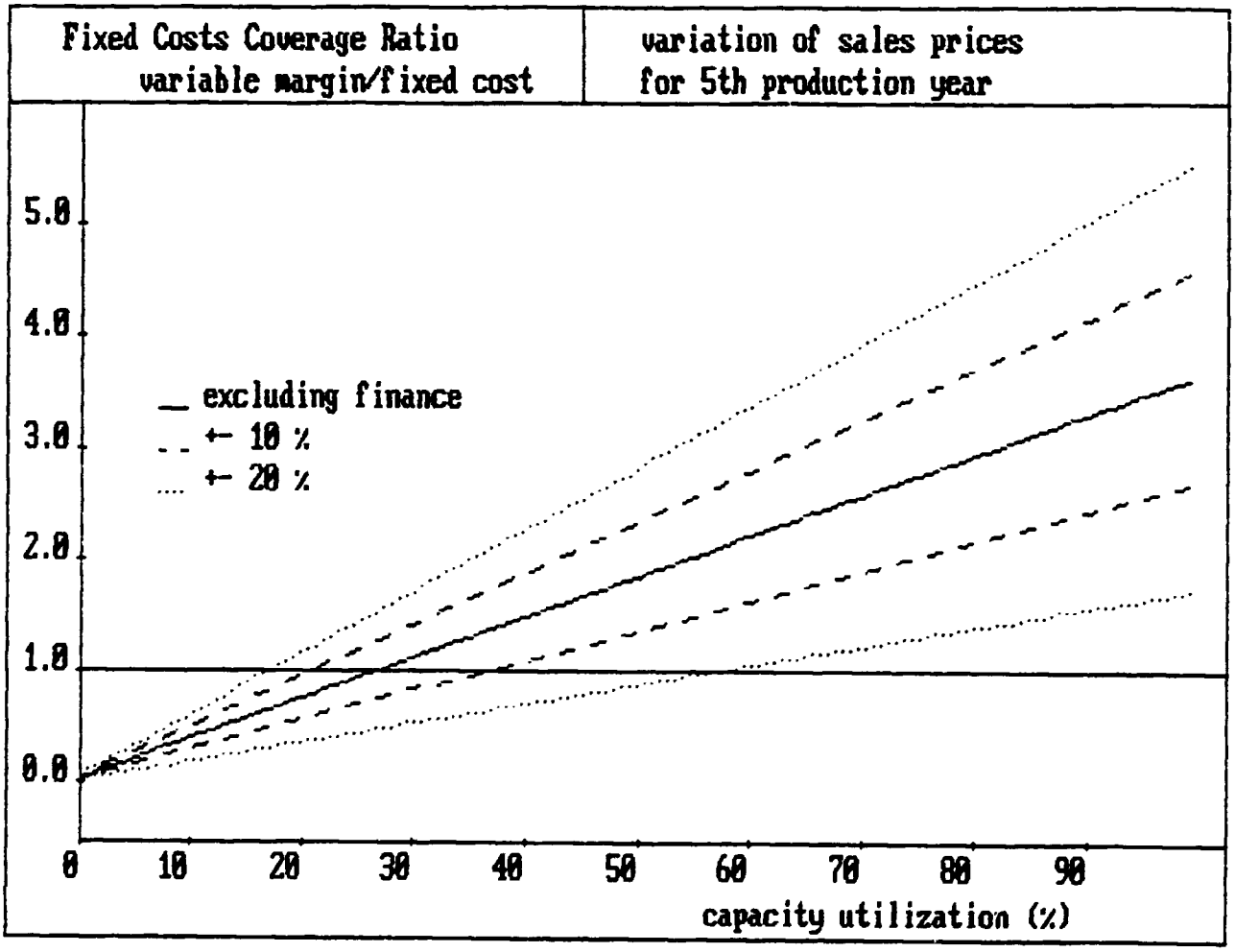

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of interest
5.0
4.0
3.0
2.0
1.0
0.0
including finance
← 10 %
← 20 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

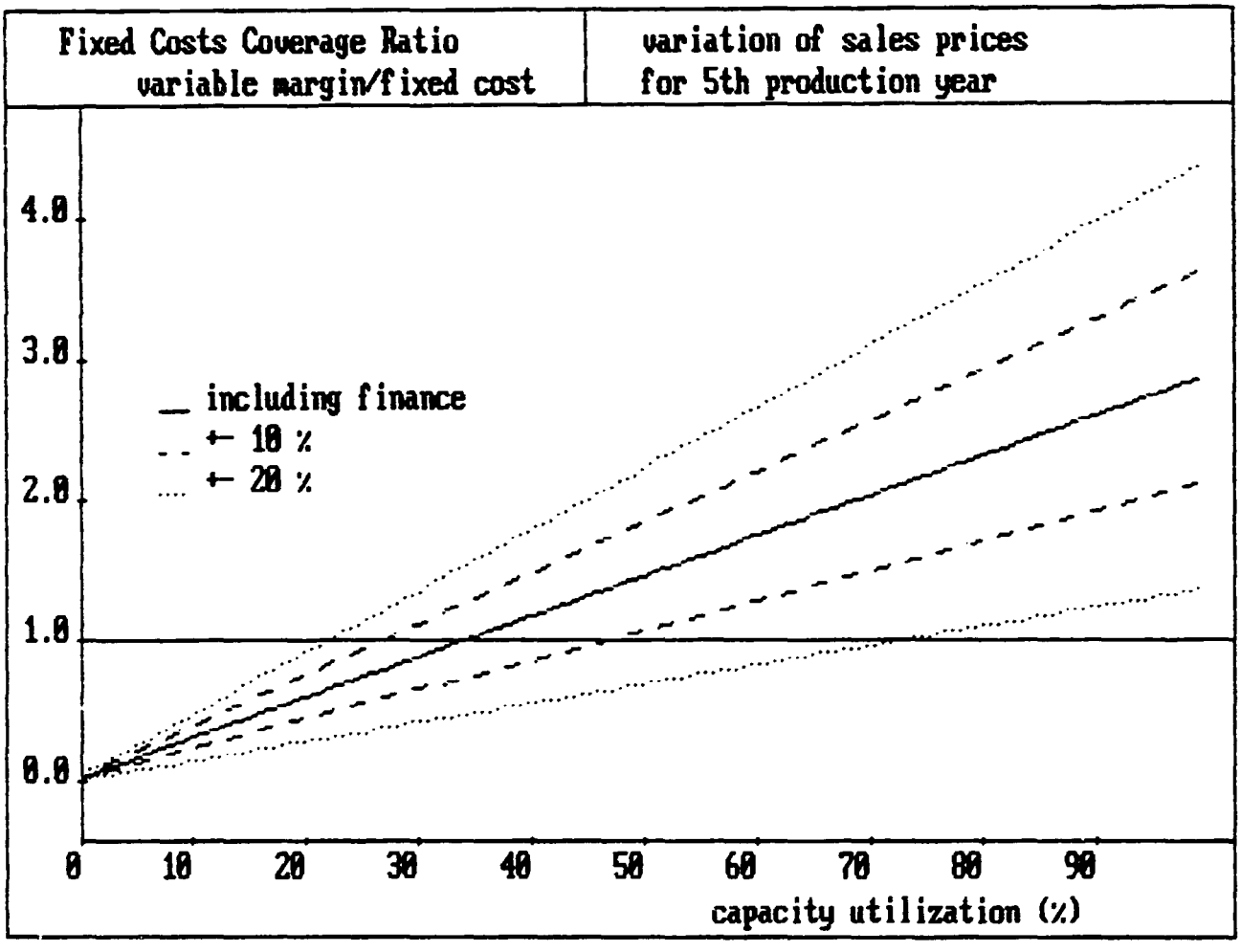

Fixed Costs Coverage Ratio
variable margin/fixed cost
excluding finance
for 5th production year
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
excluding finance
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

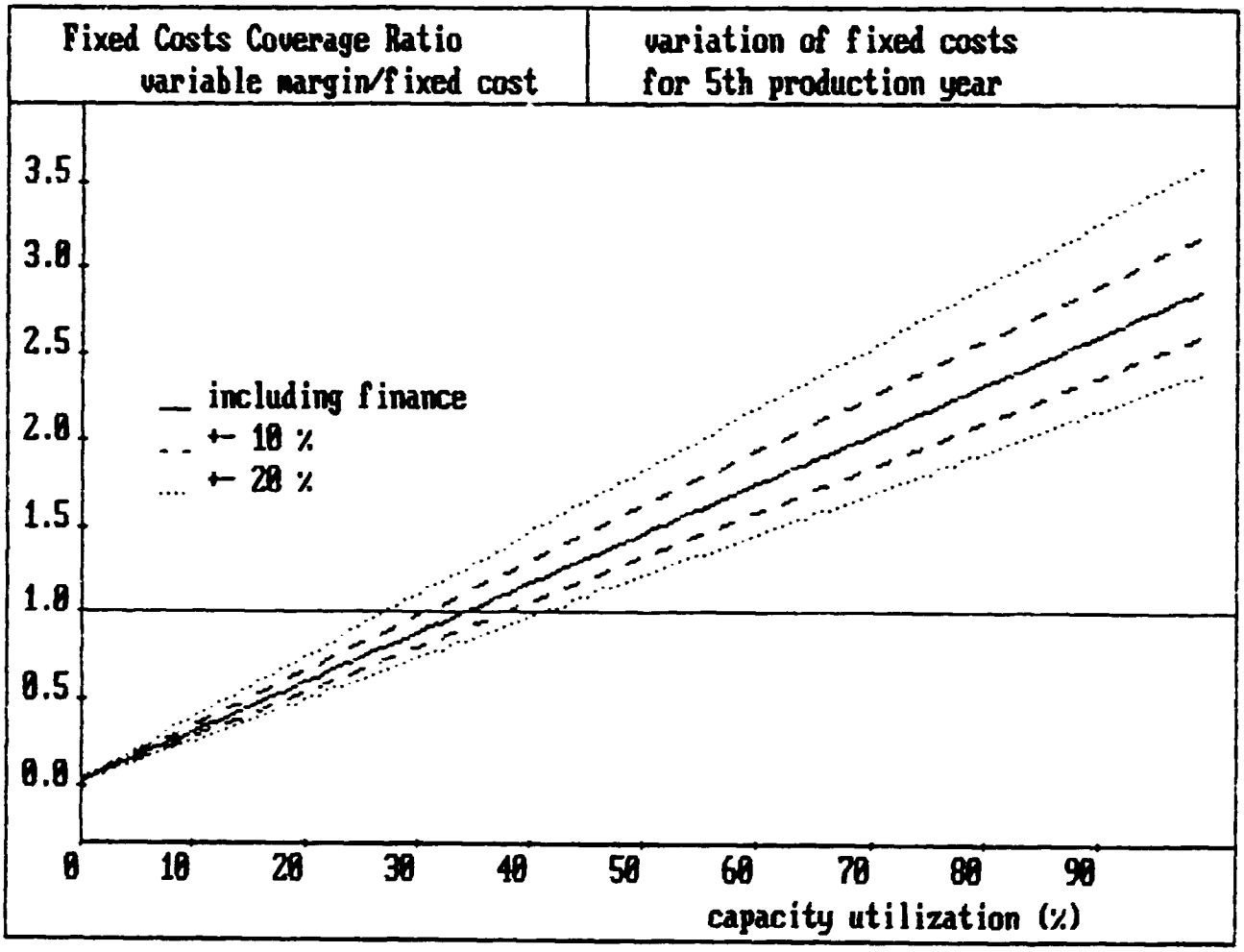

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of variable costs
for 5th production year
5.0
4.0
3.0
2.0
1.0
0.0
excluding finance
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capcity utilization (%)

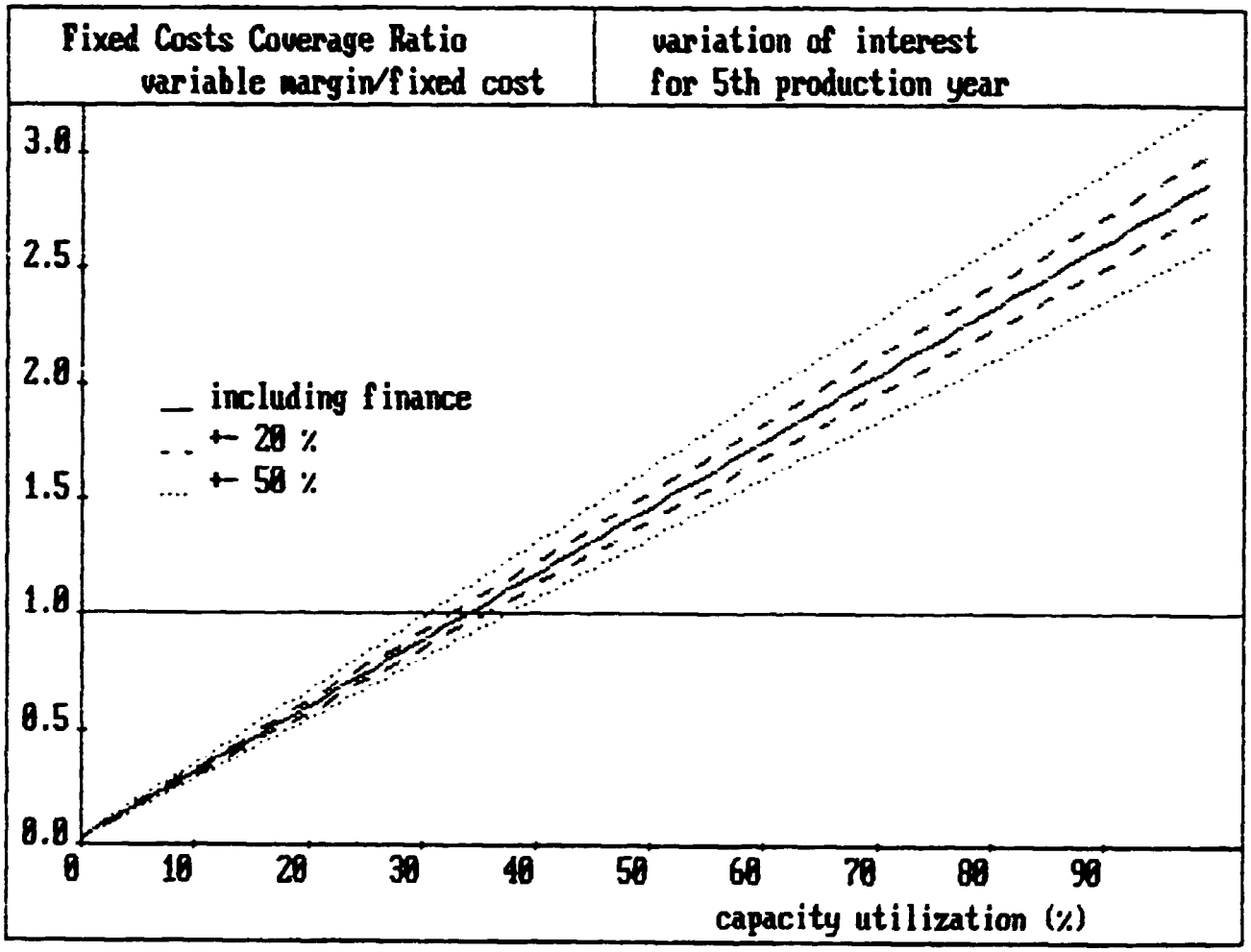

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of fixed costs
for 5th production year
4.0
3.0
2.0
1.0
0.0
excluding finance
← 10 %
← 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

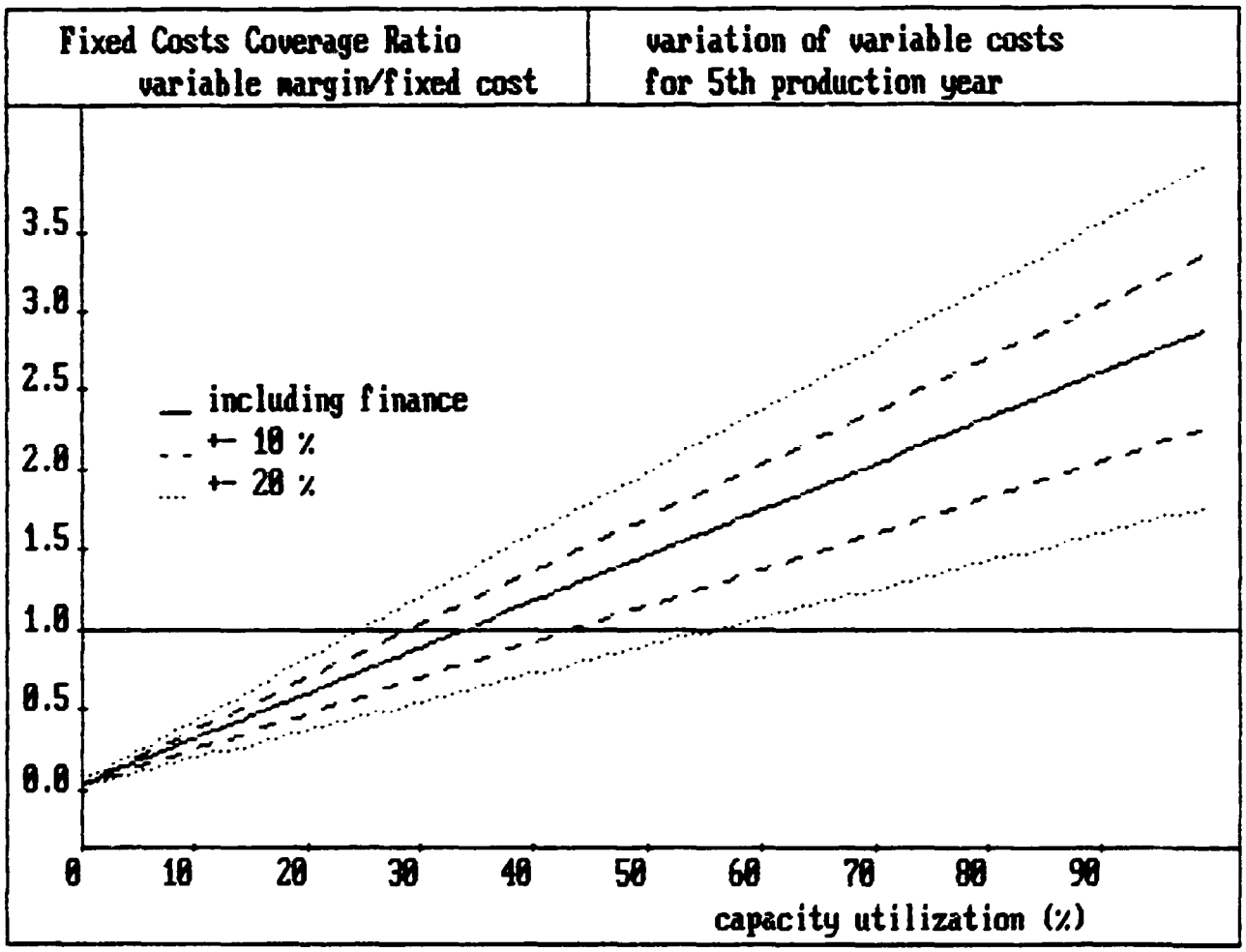

Fixed Costs Coverage Ratio
variable margin/fixed cost
including finance
for 5th production year
3.0
2.5
2.0
1.5
1.0
0.5
0.0
including finance
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

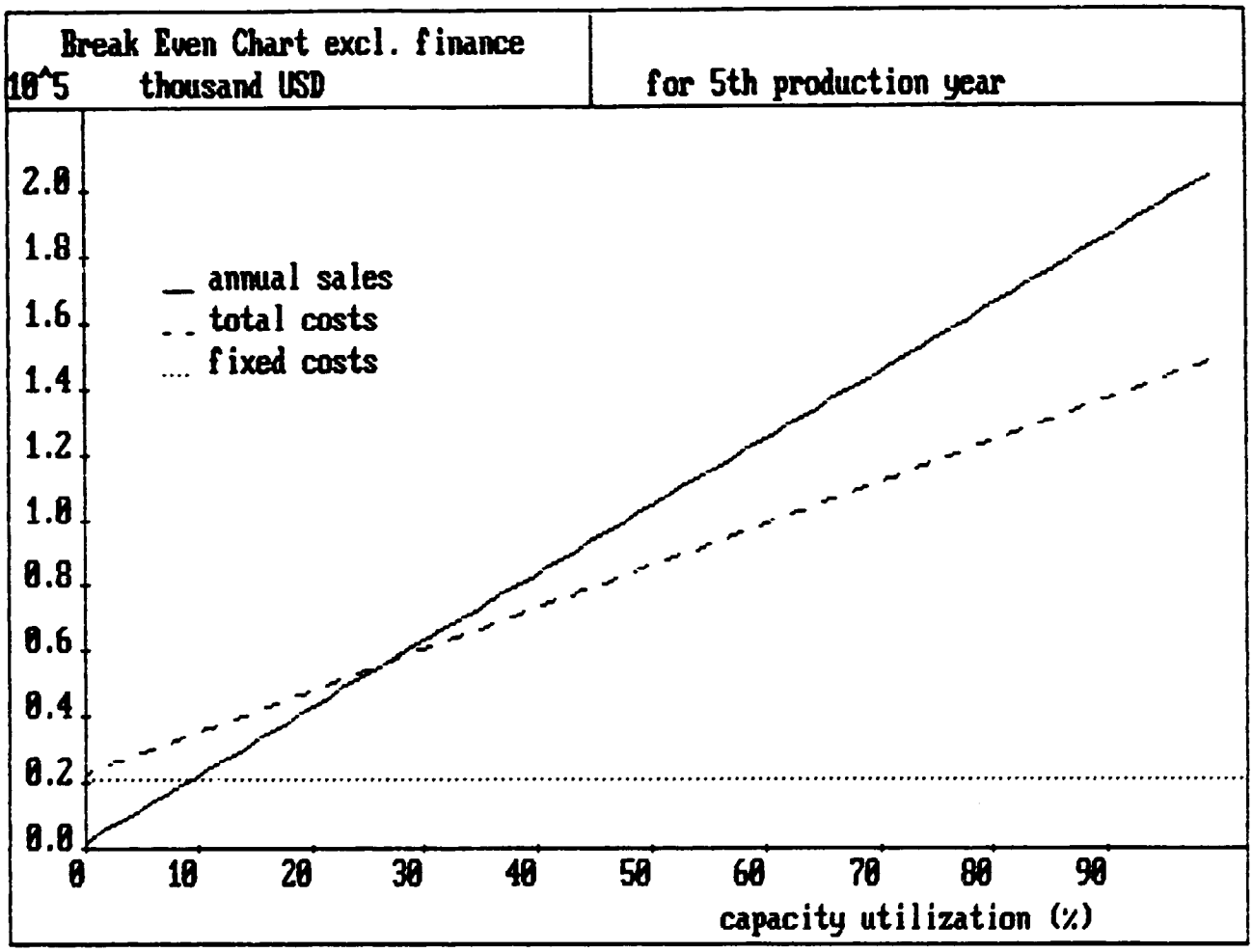

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of sales prices
for 5th production year
5.0
4.0
3.0
2.0
1.0
0.0
excluding finance
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

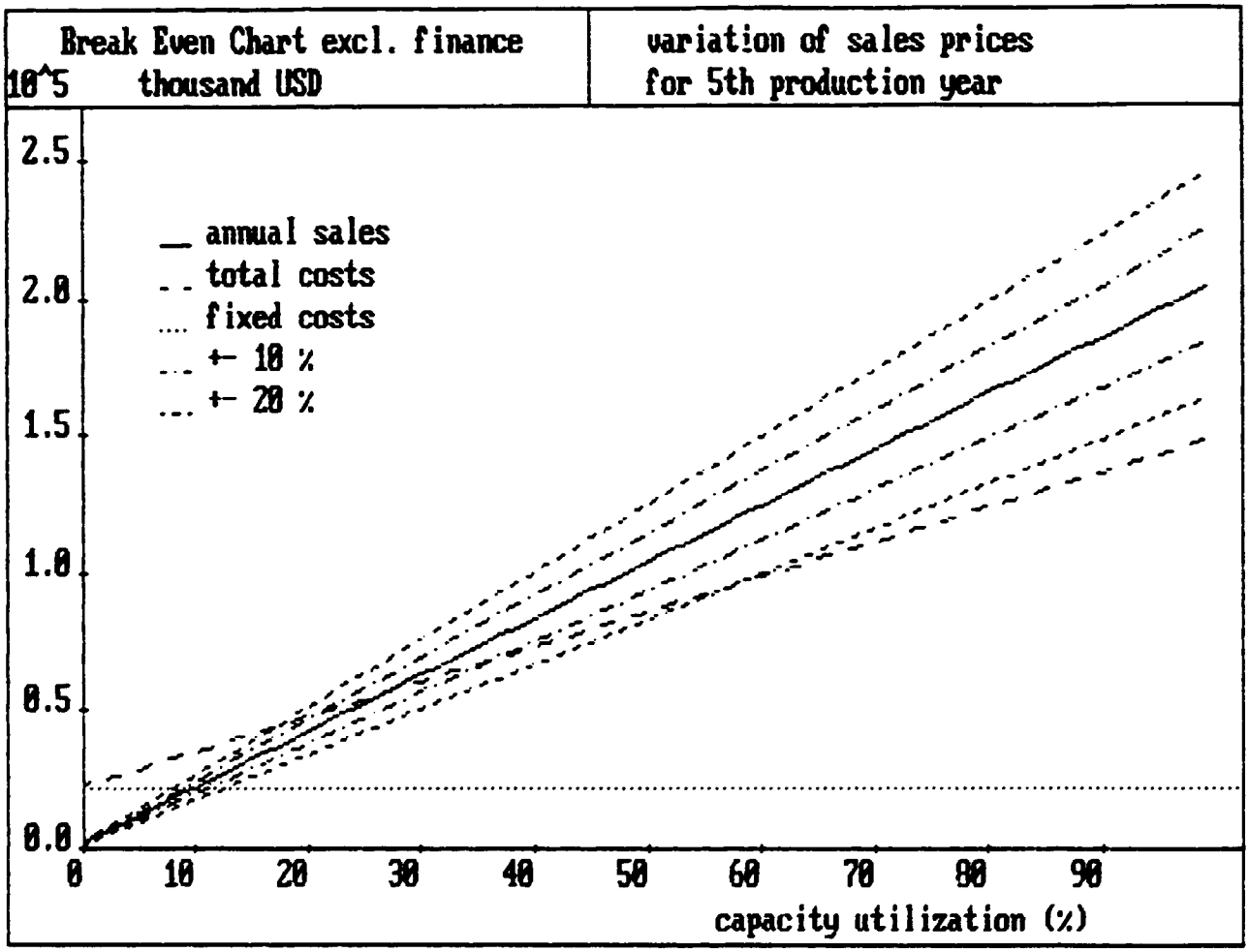

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of sales prices
for 5th production year
4.0
3.0
2.0
1.0
0.0
including finance
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

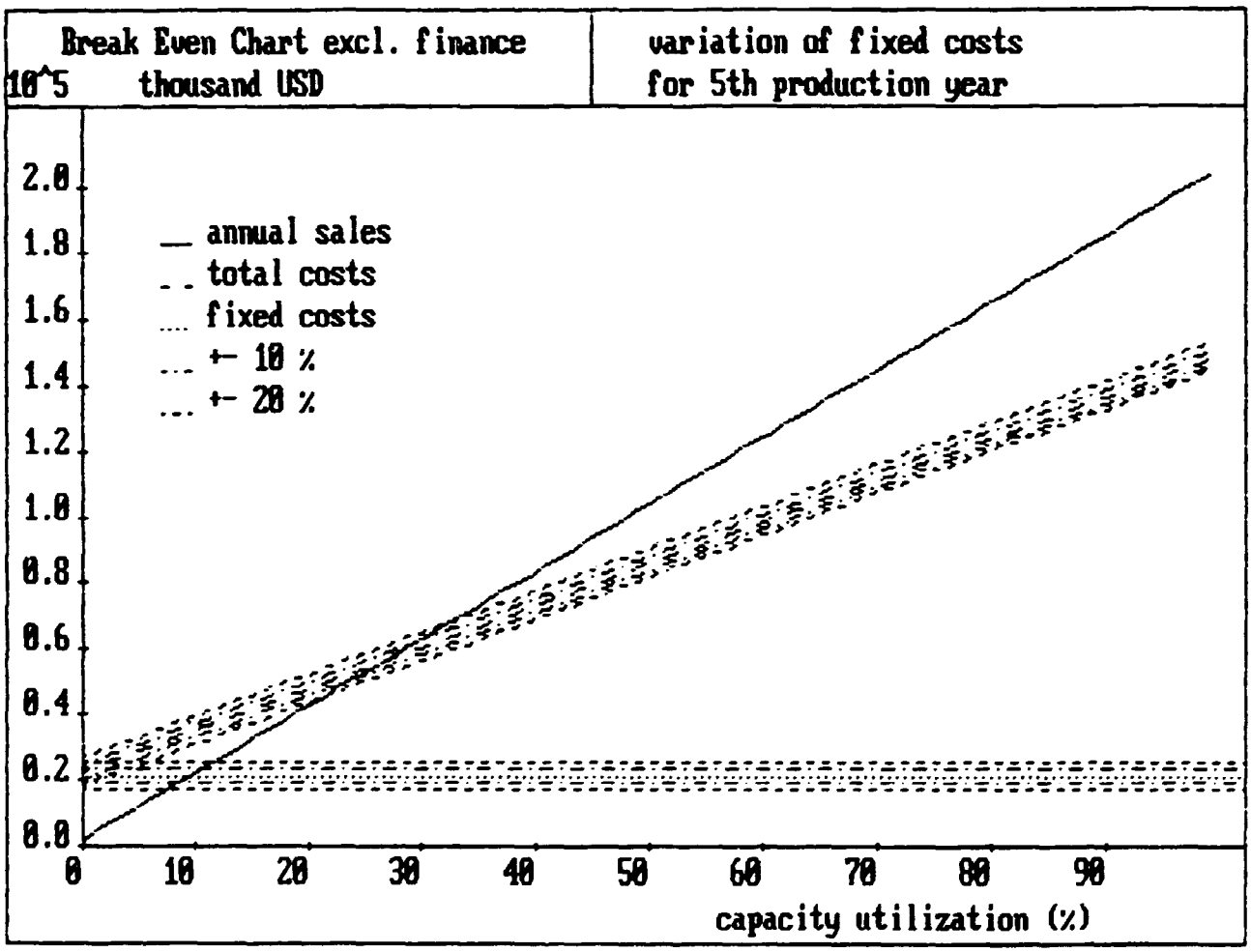

Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of fixed costs
for 5th production year
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
including finance
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of interest
for 5th production year
3.0
2.5
2.0
1.5
1.0
0.5
0.0
including finance
+- 20 %
+- 50 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Fixed Costs Coverage Ratio
variable margin/fixed cost
variation of variable costs
for 5th production year
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
including finance
← 10 %
← 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break Even Chart excl. finance
10^5 thousand USD
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break Even Chart excl. finance
10^5 thousand USD
variation of sales prices
for 5th production year
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break Even Chart excl. finance
10^5 thousand USD
variation of fixed costs
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

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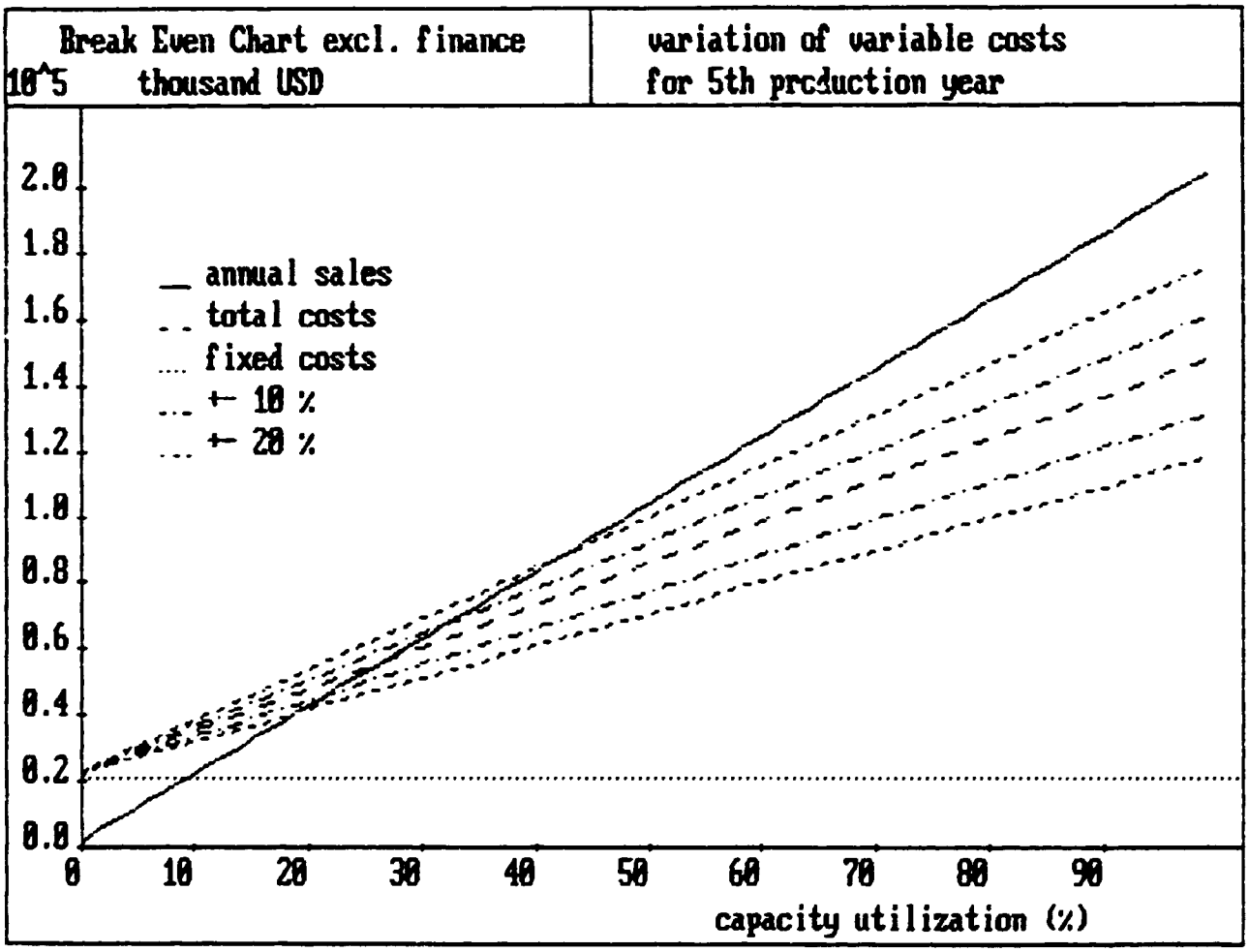
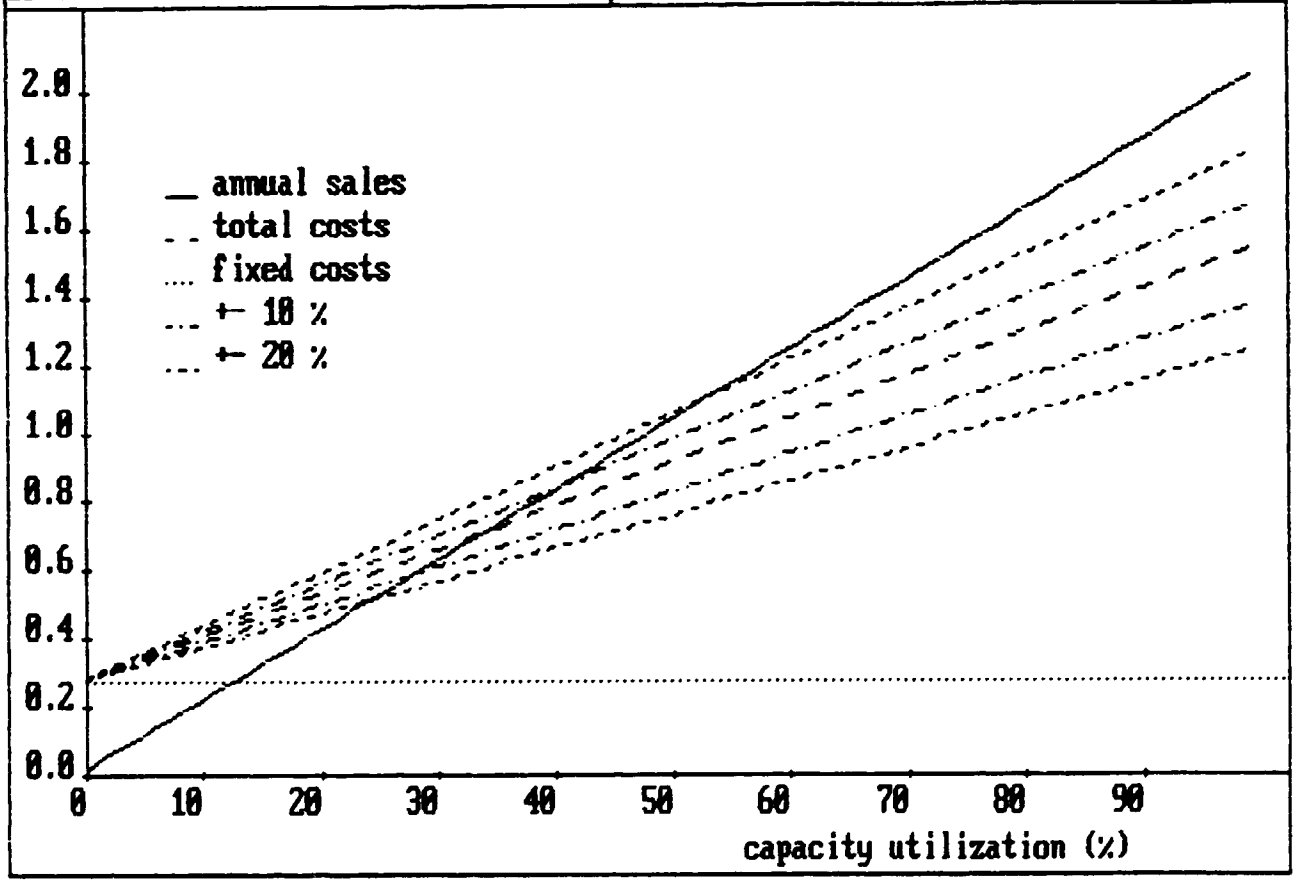
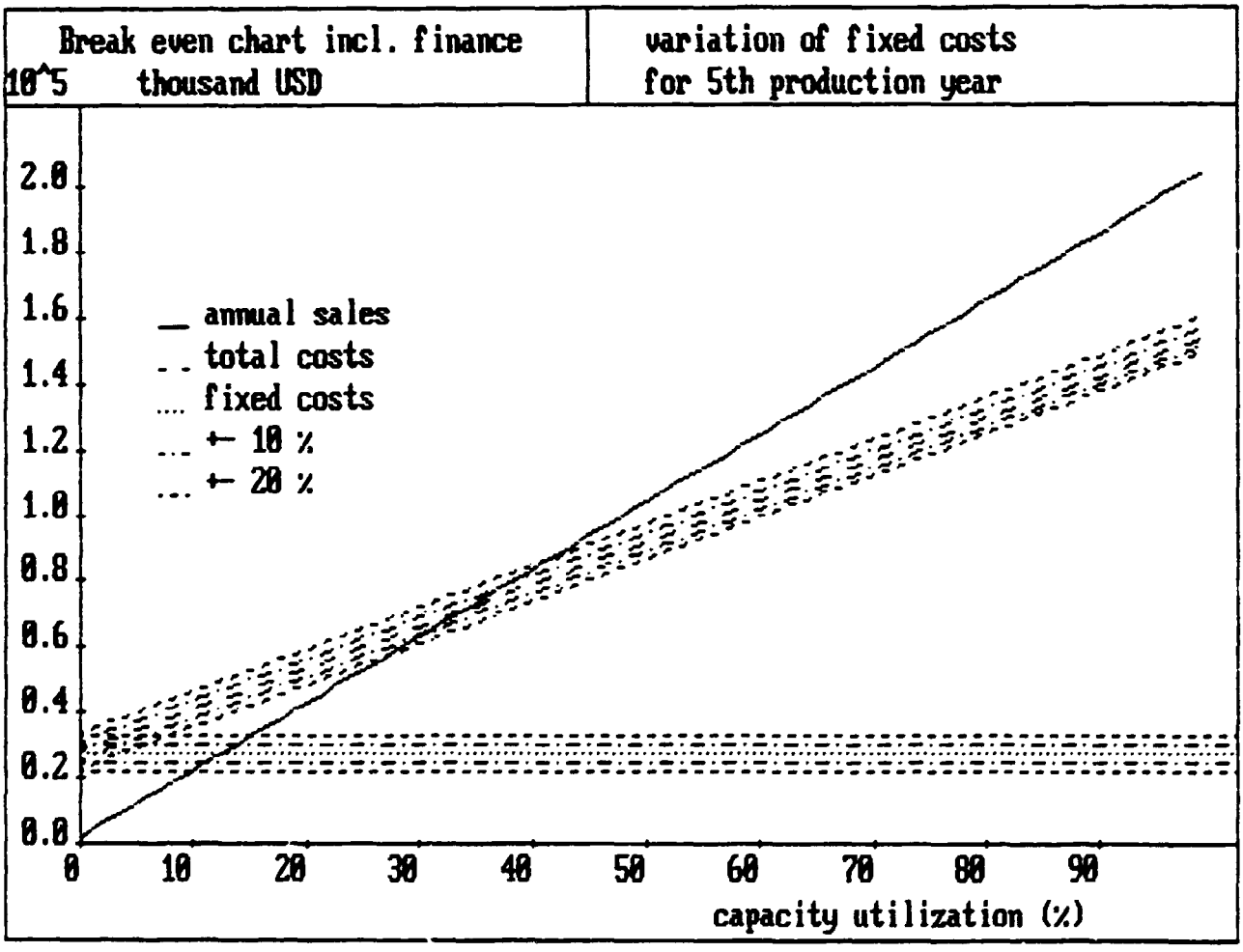
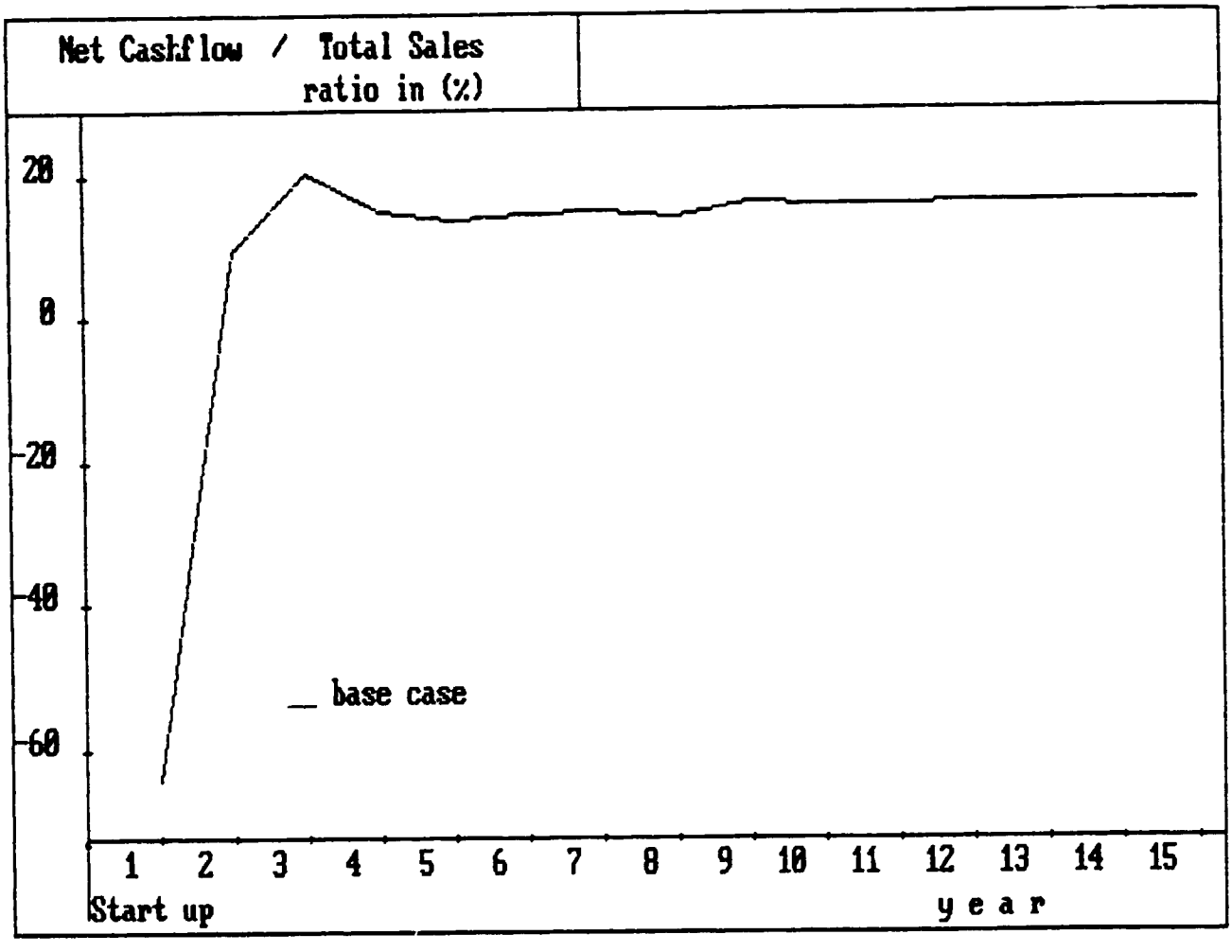
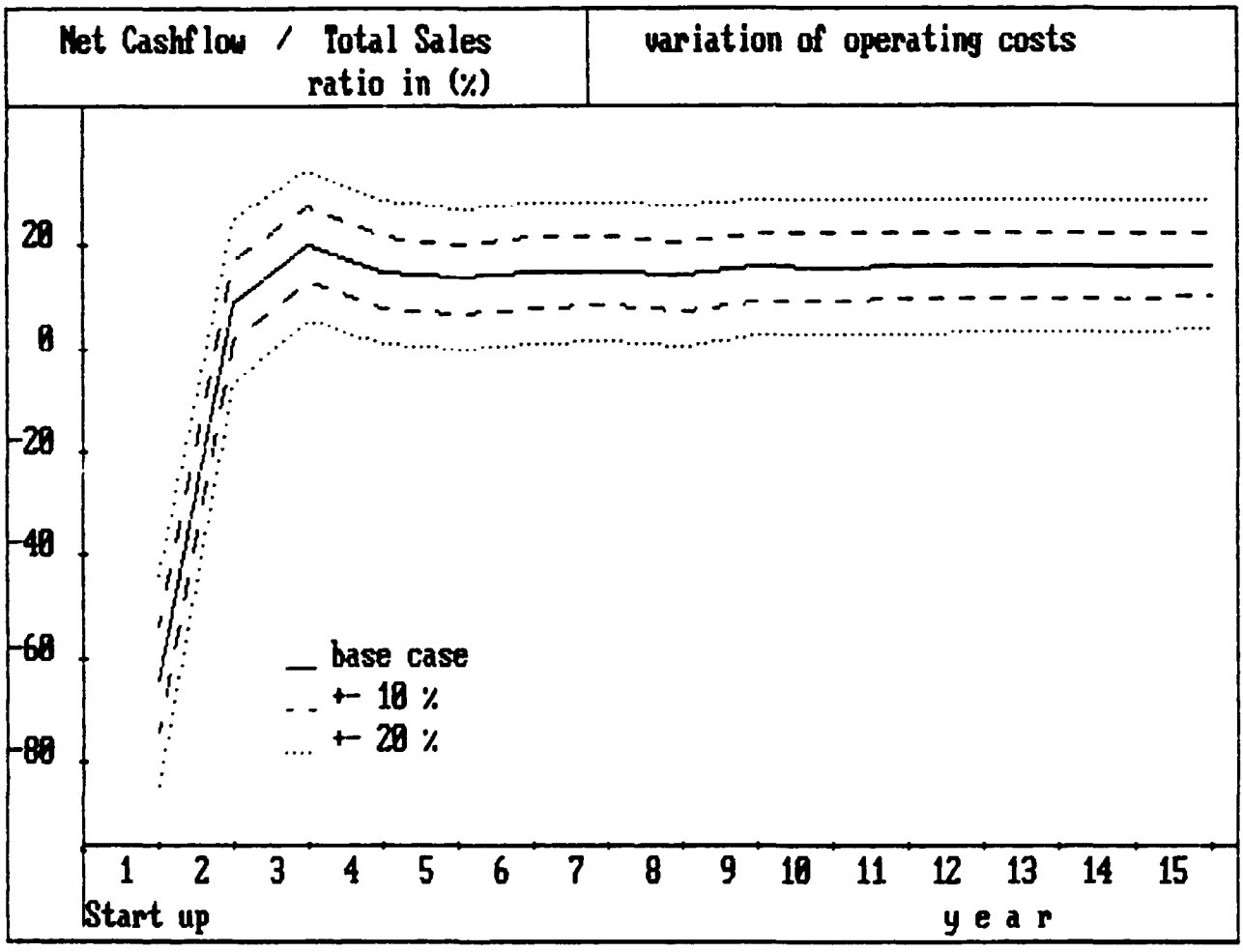


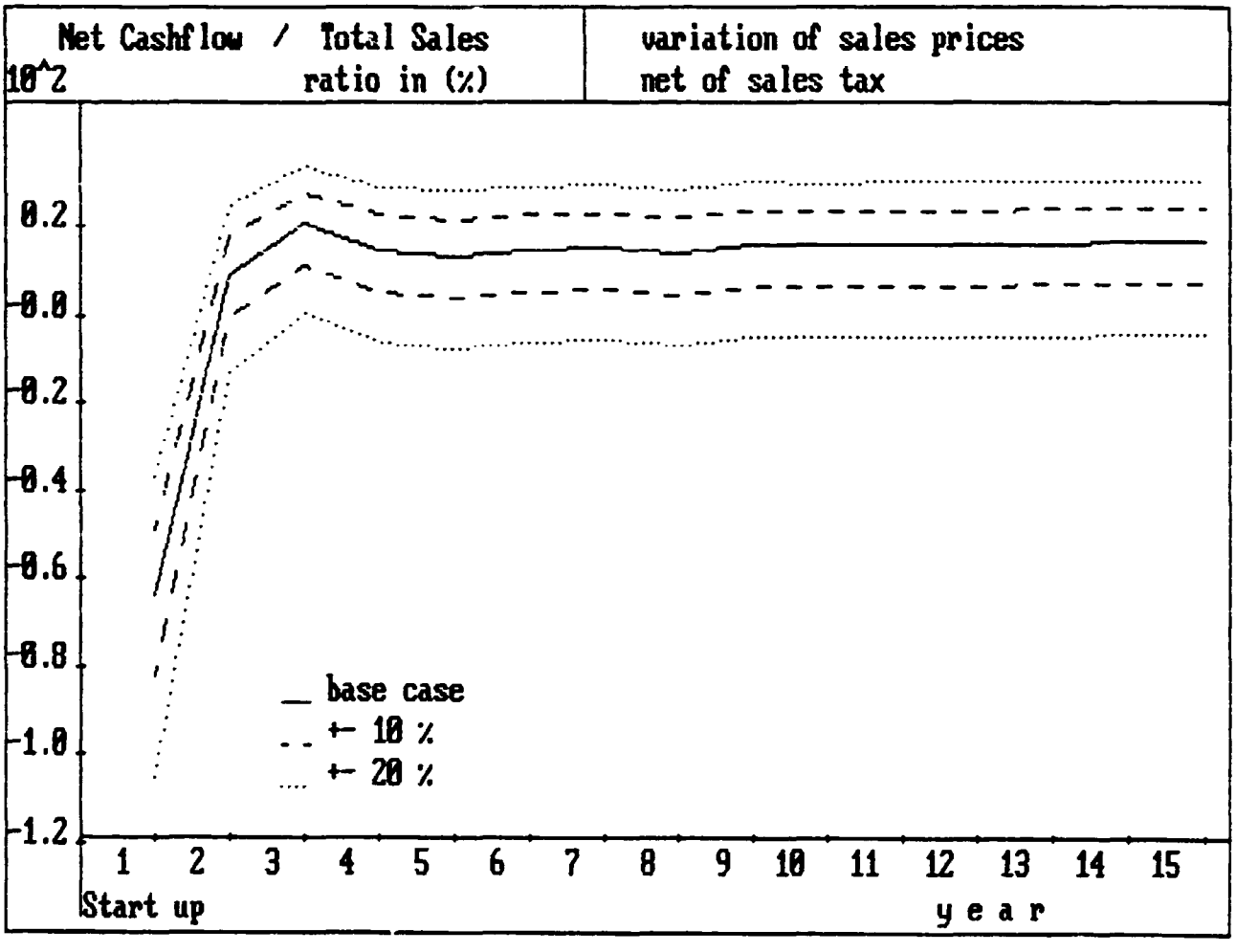
Break even chart incl. finance | variation of variable costs for 5th production year

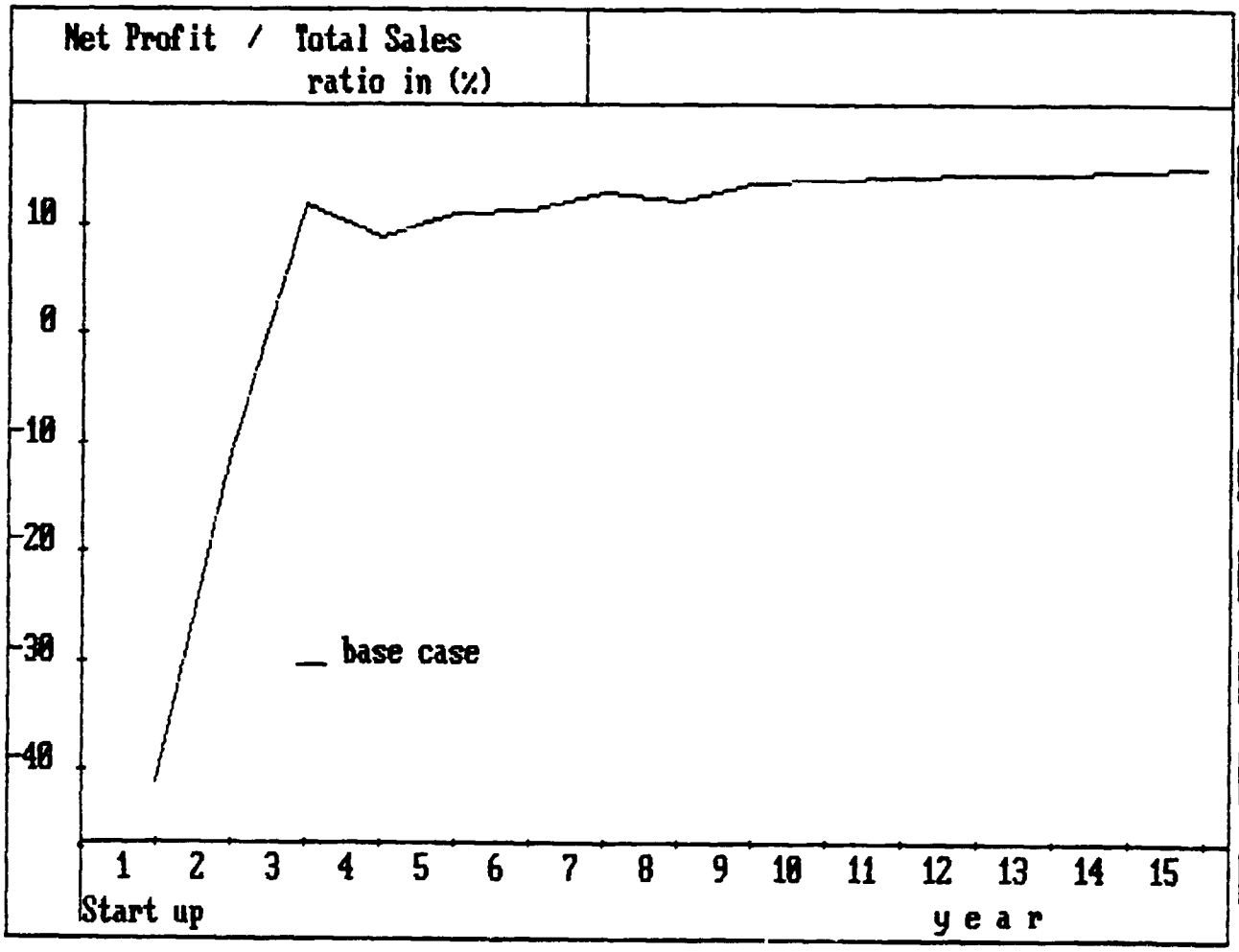


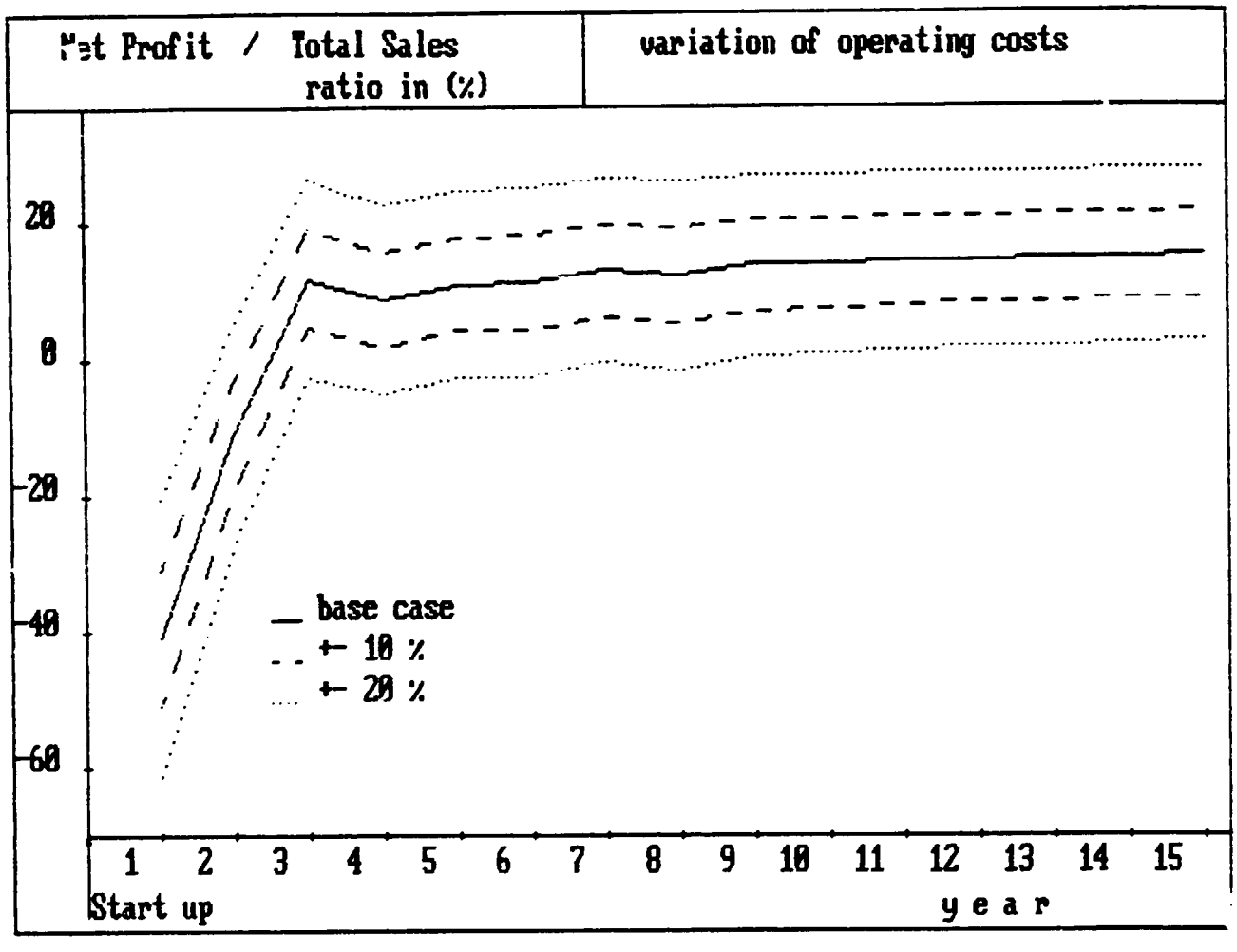

Break even chart incl. finance
10^5 thousand USD
variation of fixed costs
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
← 10 %
← 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

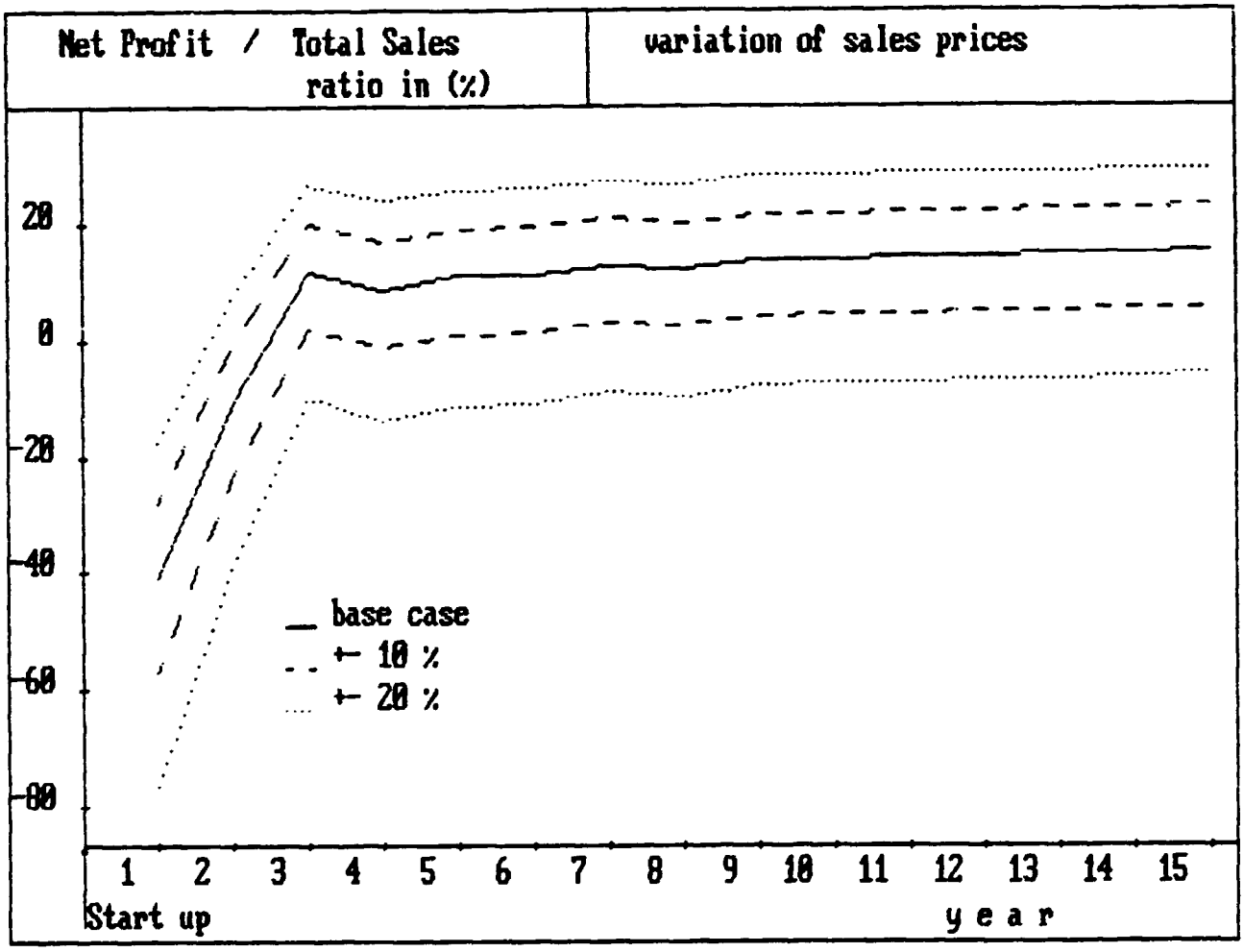

Net Cashflow / Total Sales
ratio in (%)
20
0
-20
-40
-60
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

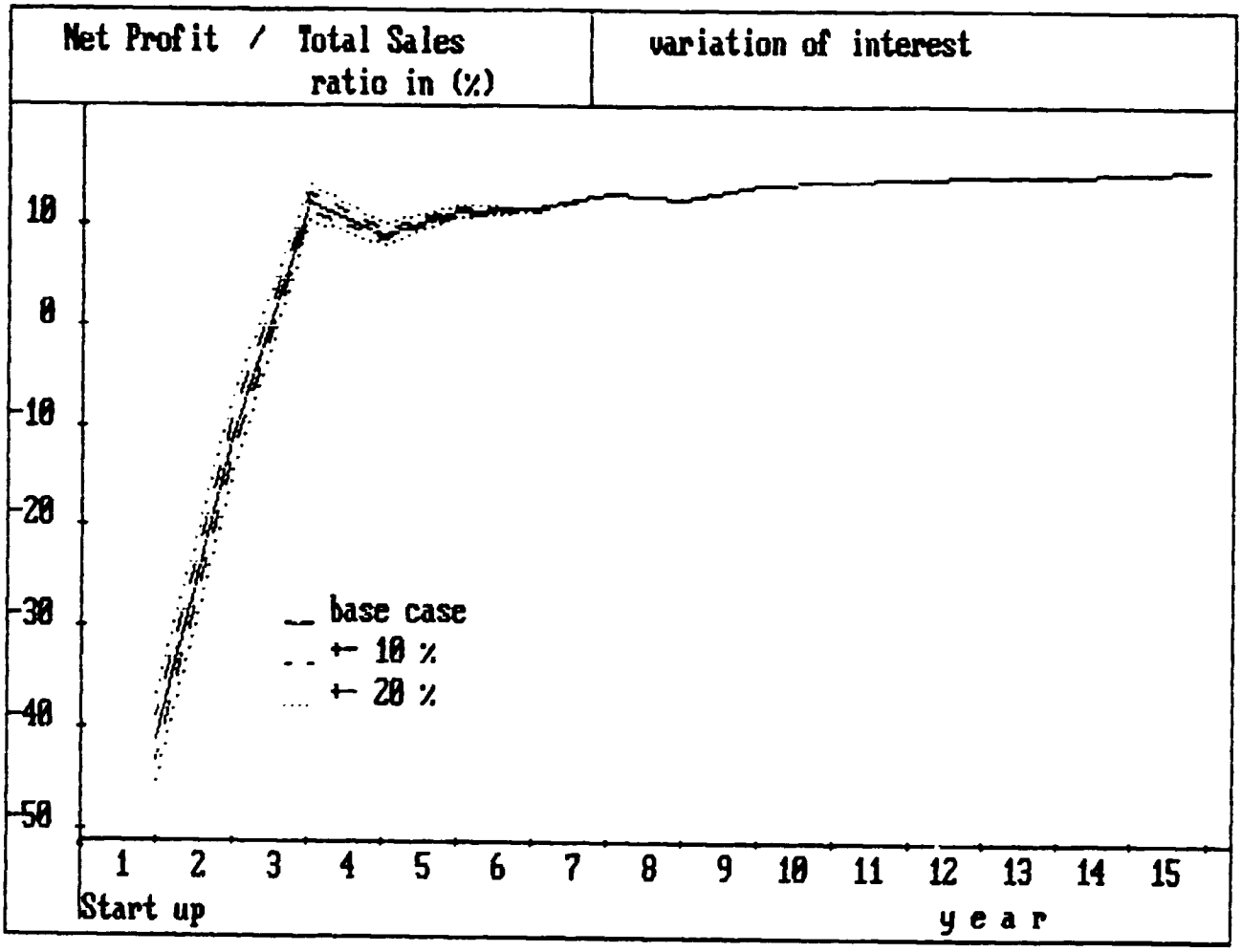

Net Cashflow / Total Sales ratio in (%)
variation of operating costs
20
0
-20
-40
-60
-80
base case
+- 10 %
+- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Net Cashflow / Total Sales
10^2 ratio in (%)
variation of sales prices
net of sales tax
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
base case
+- 10 %
+- 20 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

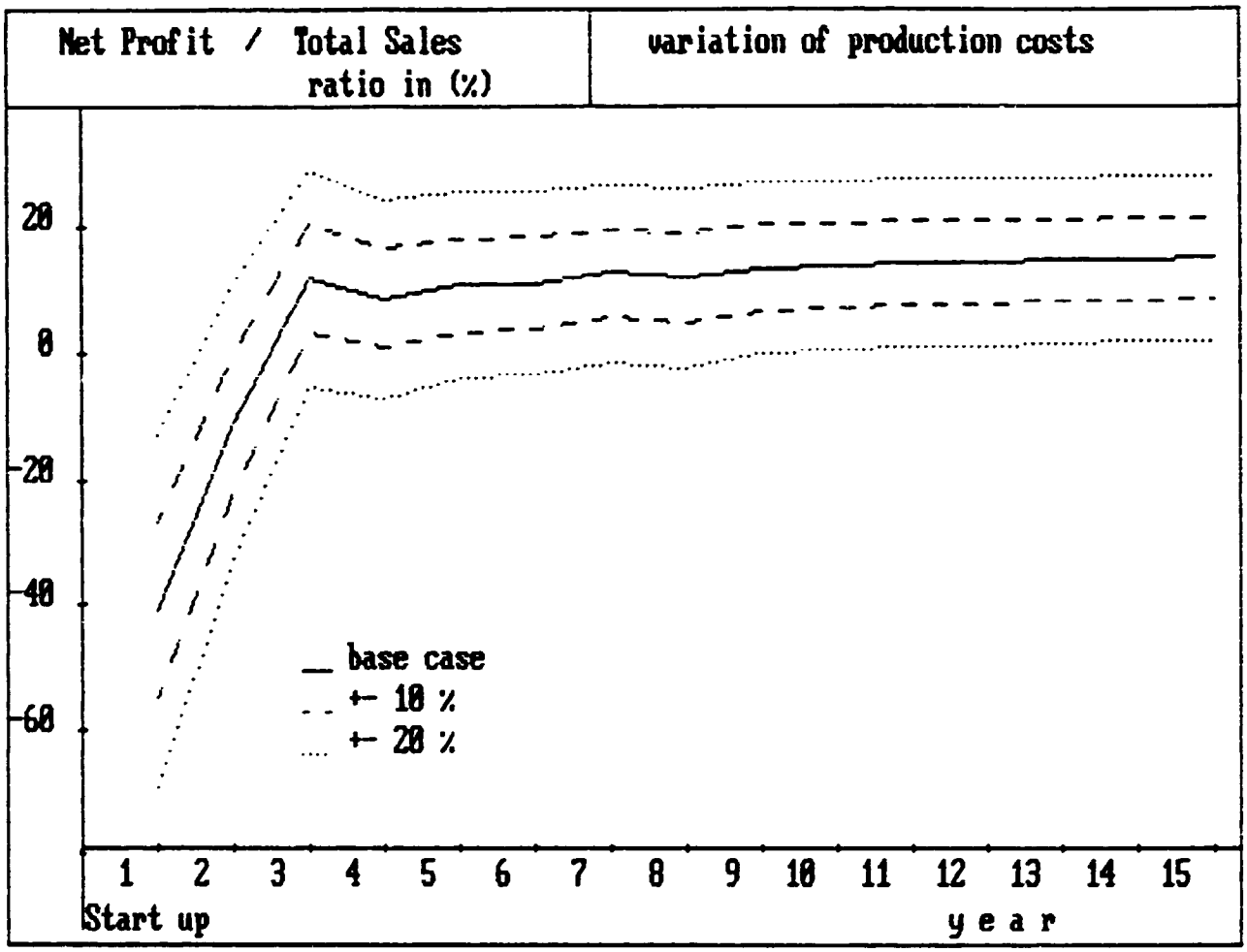

Net Profit / Total Sales
ratio in (%)
10
0
-10
-20
-30
-40
base case
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

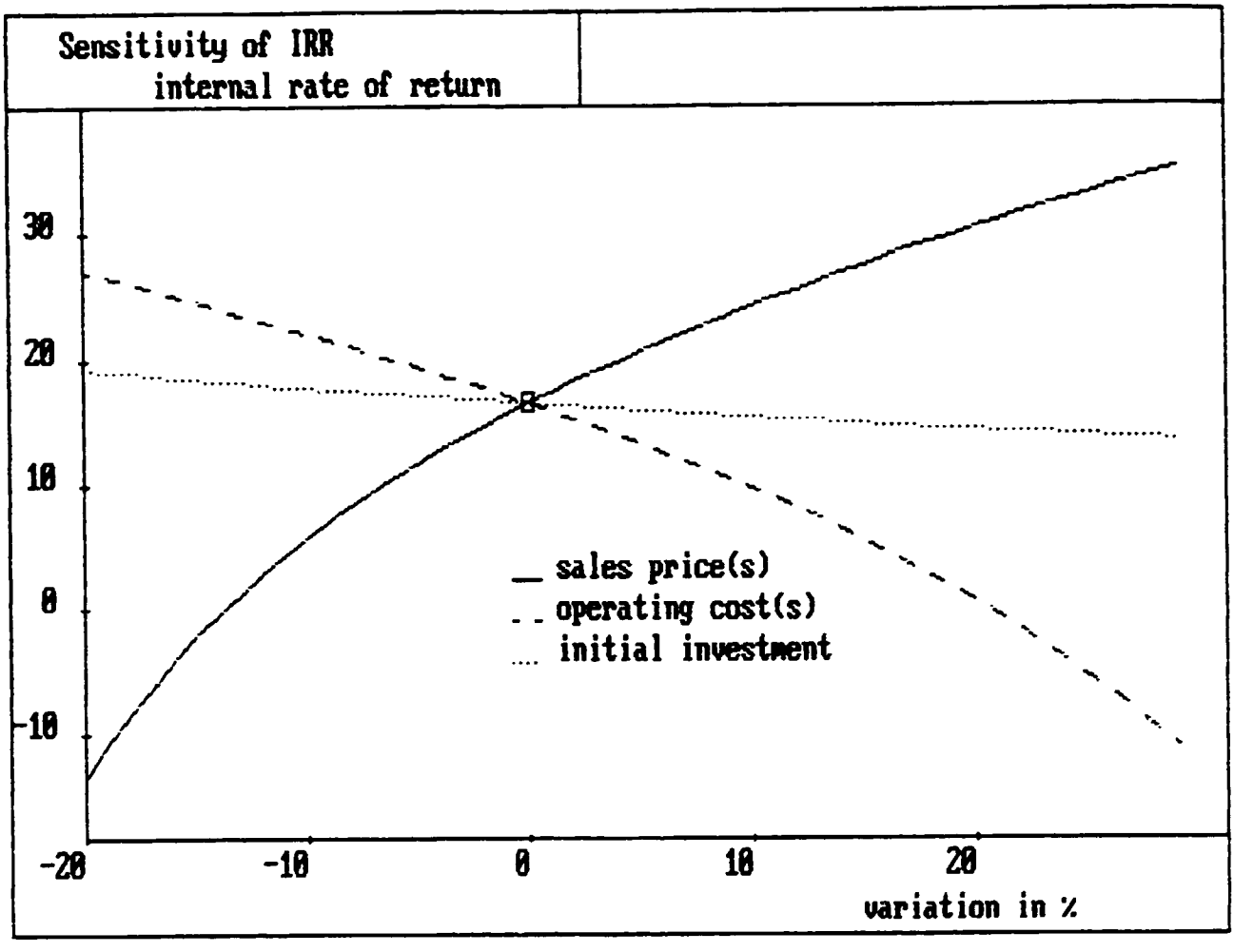

Net Profit / Total Sales
ratio in (%)
variation of operating costs
20
0
-20
-40
-60
base case
+- 10 %
+- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

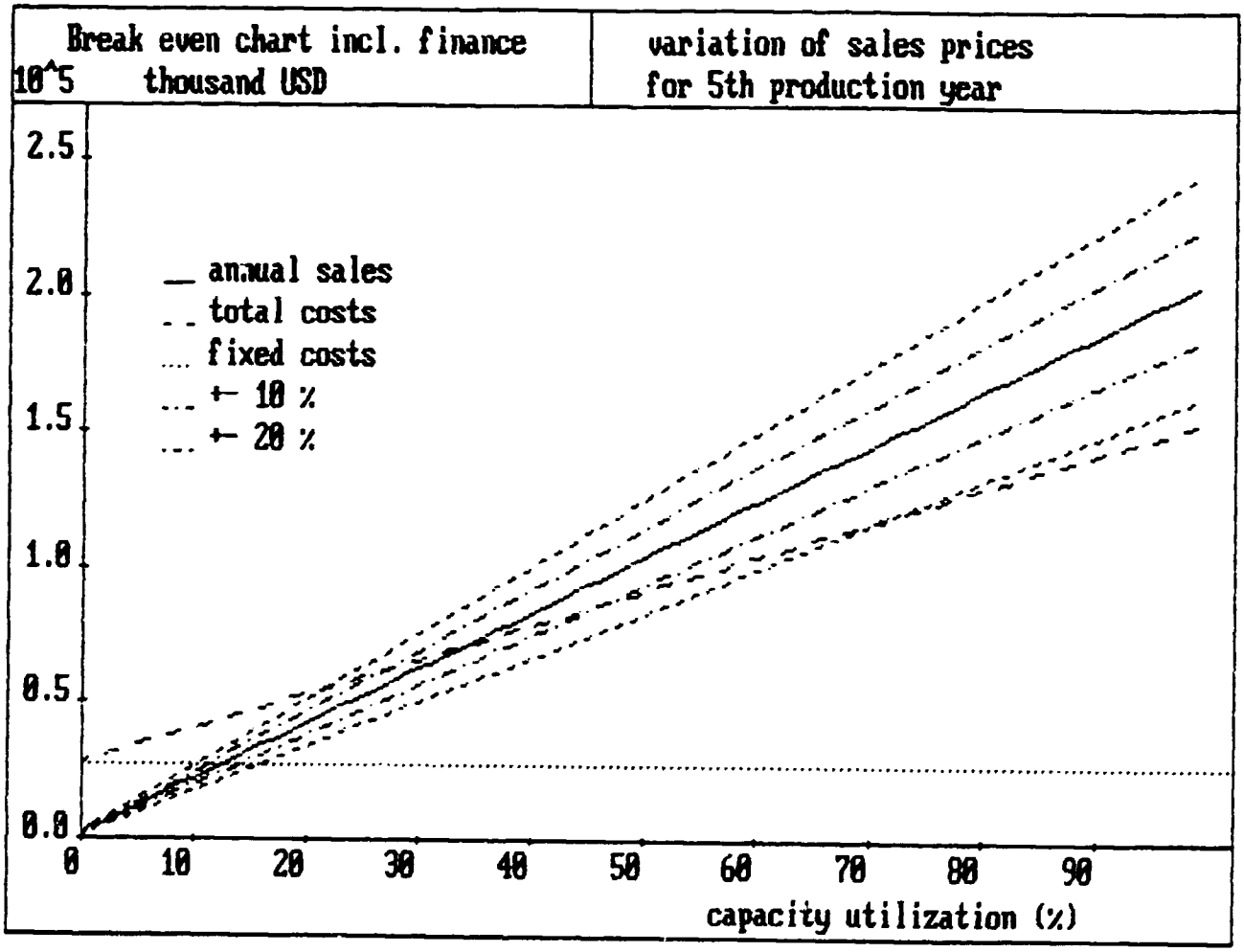

Net Profit / Total Sales ratio in (%)
variation of sales prices
20
0
-20
-40
-60
-80
base case
- 10 %
- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Net Profit / Total Sales ratio in (%)
variation of interest
10
0
-10
-20
-30
-40
-50
base case
+- 10 %
+- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

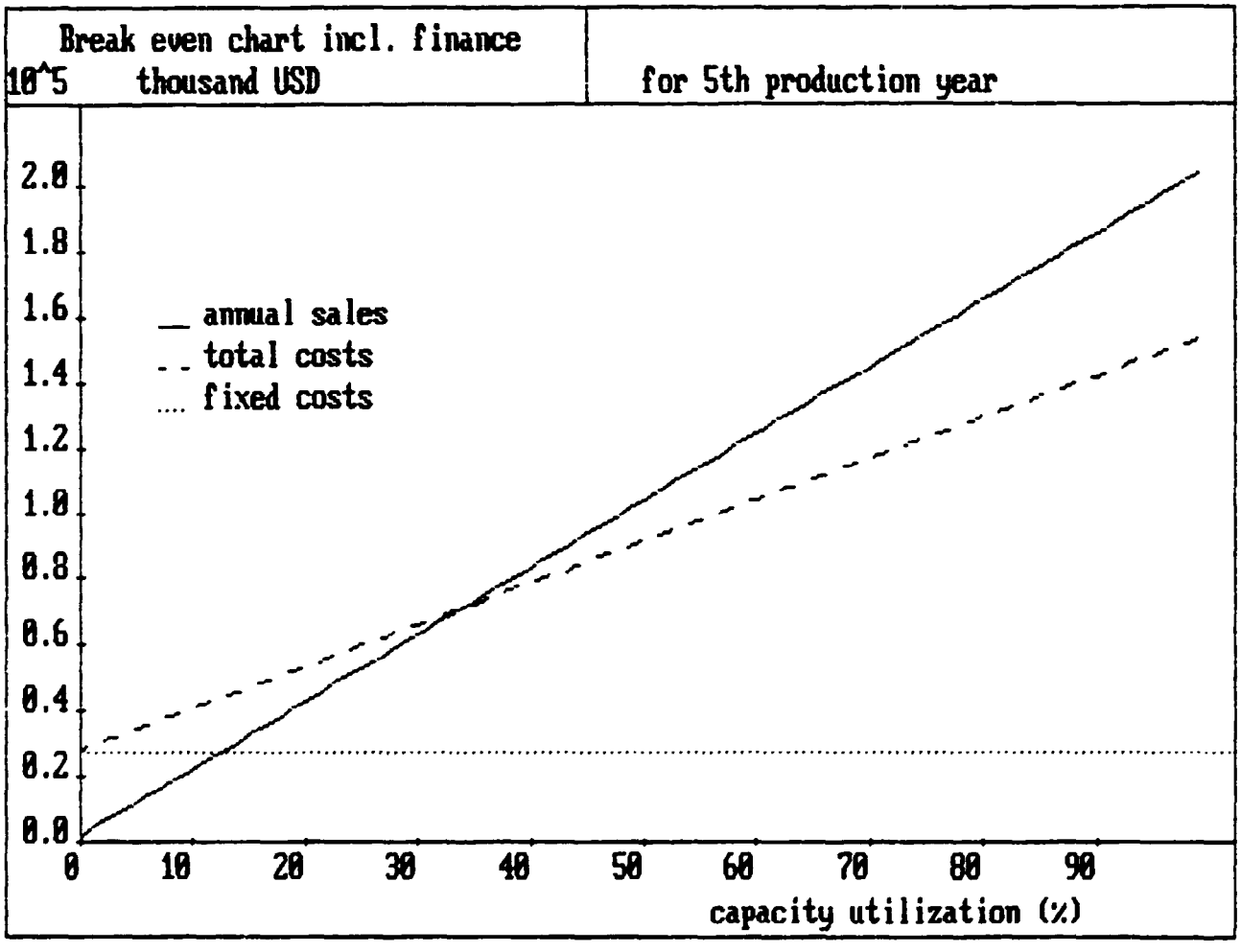

COMFAR
UNIDO

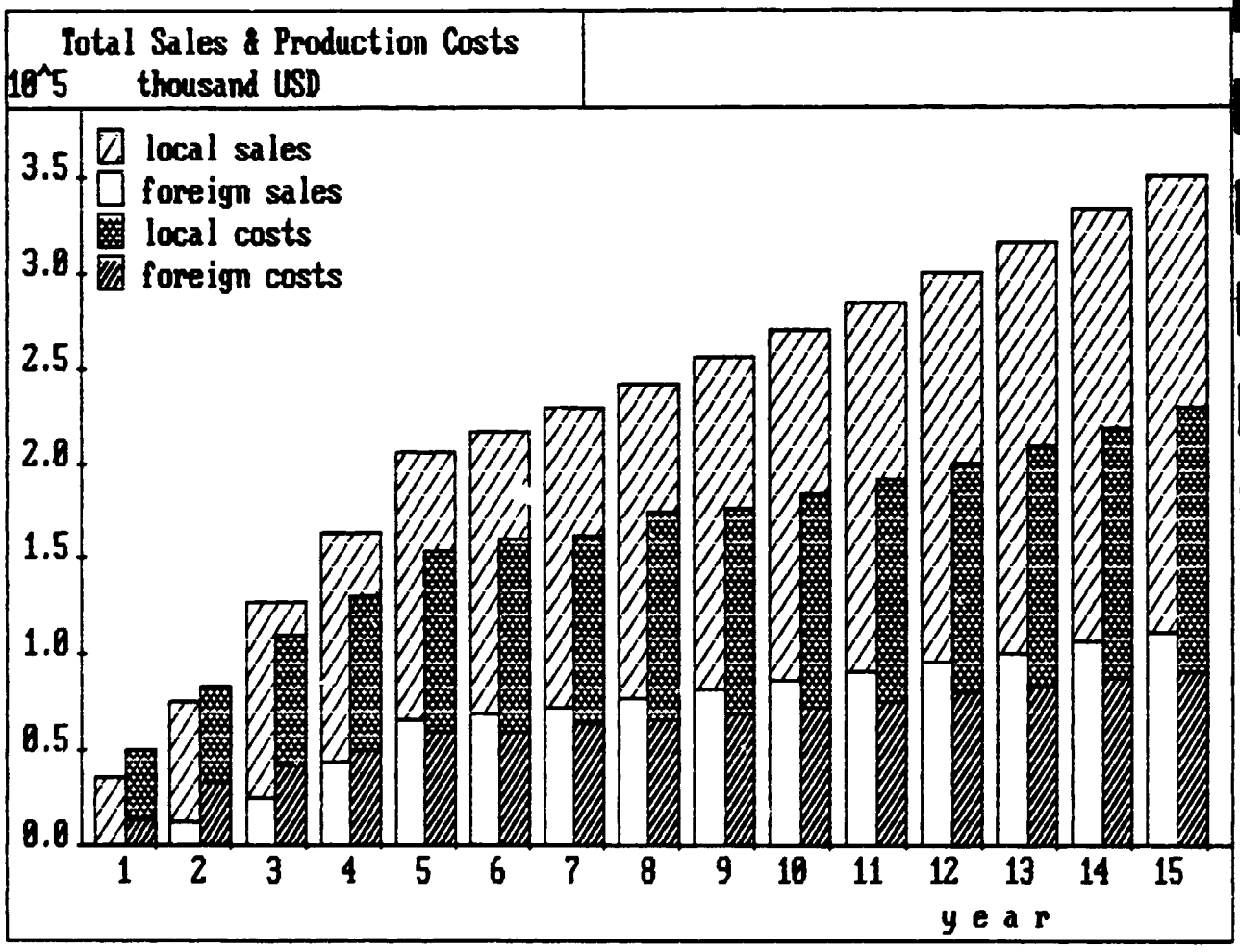

Net Profit / Total Sales ratio in (%)
variation of production costs
20
0
-20
-40
-60
base case
+- 10 %
+- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Sensitivity of IRR
internal rate of return
30
20
10
0
-10
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment


Break even chart incl. finance
10^5 thousand USD
variation of sales prices
for 5th production year
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

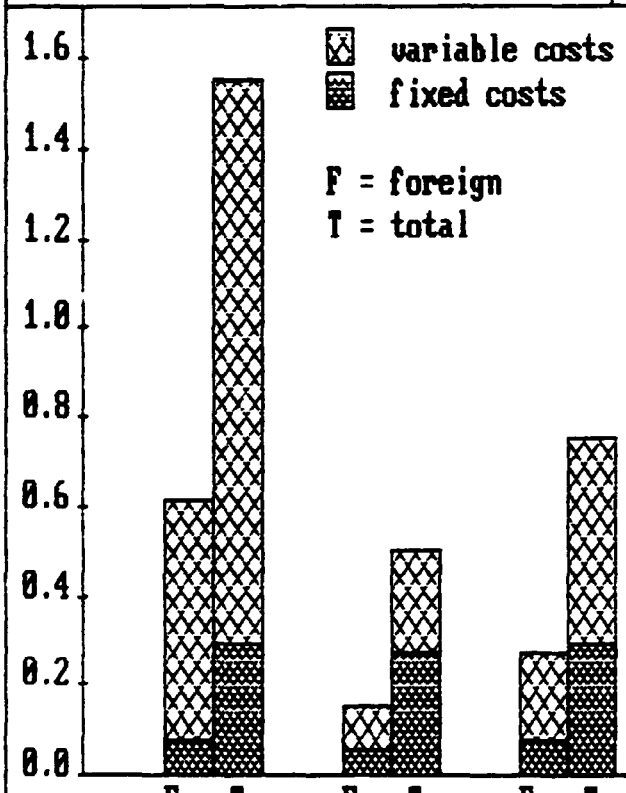
COMFA


Break even chart incl. finance
10^5 thousand USD
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Total Sales & Production Costs
10^5 thousand USD
local sales
foreign sales
local costs
foreign costs
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
year

Structure of Production Costs for 5th production year

10^5 thousand USD



Nominal	Start up	
71.43	39.91	raw material
6.77	4.60	other RM
3.00	4.17	utilities
0.14	0.20	energy
0.95	3.31	labour
1.13	2.43	maintenance
0.59	0.64	spares
7.92	17.49	overheads
4.37	12.51	depreciation
3.61	14.75	interest
100.00	100.00	Total Prod C.

Results of Financial and Economical Analysis

VARIANT 1 A

5000 Trucks per year

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Production road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.1A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	111590.00	52.146 % foreign
current assets:	450.00	100.000 % foreign
total assets:	112040.00	52.338 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	70000.00	
local loans :	55600.00	
total funds :	125600.00	55.732 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	42951.34	184613.70	288133.10
depreciation :	6326.64	6984.59	6984.59
interest :	0.00	5817.30	0.00
production costs	49277.98	197415.00	295117.70
thereof foreign	29.81 %	38.28 %	39.54 %
total sales :	39897.00	294817.90	485526.80
gross income :	-14120.98	66245.19	149398.60
net income :	-14120.98	29810.34	67229.35
cash balance :	-33313.30	-3484.31	71223.34
net cashflow :	-33313.30	29099.34	71223.34

Net Present Value at: 11.50 % = 111555.00
Internal Rate of Return: 19.30 %
Return on equity1: 59.13 %
Return on equity2: 25.07 %

Index of Schedules produced by COMFAR

Total initial investment
Total investment during production
Total production costs
Working Capital requirements
Cashflow Tables
Projected Balance
Net Income statement
Source of finance

Total Initial Investment in thousand USD

Year	1995	1996	1997
Fixed investment costs			
Land, site preparation, development	1215.000	530.000	0.000
Buildings and civil works	5070.000	12580.000	13020.000
Auxiliary and service facilities	2540.000	7240.000	8680.000
Incorporated fixed assets	320.000	325.000	430.000
Plant machinery and equipment	4270.000	23140.000	28260.000
Total fixed investment costs	13415.000	43815.000	50390.000
Pre-production capital expenditures	0.000	0.000	3970.000
Net working capital	0.000	0.000	450.000
Total initial investment costs	13415.000	43815.000	54810.000
Of it foreign, in %	31.000	52.813	56.979

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Total Current Investment in thousand USD

Year	1998	1999	2000	2001	2002
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	4130.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	1840.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	690.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	4850.000	0.000	0.000	0.000	0.000
Total fixed investment costs	11510.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	2040.000	0.000	0.000	0.000	0.000
Working capital	11968.960	6343.098	8330.046	9411.026	13512.590
Total current investment costs	25518.960	6343.098	8330.046	9411.026	13512.590
Of it foreign, %	45.756	42.229	42.512	42.694	44.666

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Total Current Investment in thousand USD

Year	2003	2004	2005	2006	2007
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	14574.410	2616.439	2905.574	1959.902	2990.523
Total current investment costs	14574.410	2616.439	2905.574	1959.902	2990.523
Of it foreign, %	41.575	71.227	18.299	65.728	45.230

Total Current Investment in thousand USD

Year	2008	2009	2010	2011	2012
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	3140.066	3297.066	3461.922	3635.012	3816.758
Total current investment costs	3140.066	3297.066	3461.922	3635.012	3816.758
Of it foreign, %	45.229	45.230	45.229	45.230	45.230

Total Production Costs in thousand USD

Year	1998	1999	2000	2001	2002
% of nom. capacity (single product).	13.200	26.000	42.000	56.000	78.000
Raw material 1	19605.960	40548.690	68776.800	96287.530	140820.500
Other raw materials	2220.240	4373.200	7064.400	9419.200	13119.600
Utilities	3052.504	3718.906	4578.947	5427.316	6720.728
Energy	148.552	180.978	222.837	264.124	327.068
Labour, direct	1646.840	1193.010	865.903	1212.265	1772.937
Repair, maintenance	1917.248	2075.472	2261.095	2449.349	2695.895
Spares	400.000	414.500	429.725	445.711	1082.405
Factory overheads	8670.000	9103.500	9558.674	10036.610	10538.440
Factory costs	37661.340	61608.160	93758.390	125542.100	177077.600
Administrative overheads	4190.000	4399.500	4619.474	4850.448	5092.970
Indir. costs, sales and distribution	1100.000	1155.000	1212.750	1273.387	1337.057
Direct costs, sales and distribution	280.000	808.500	1146.502	1701.703	2163.563
Depreciation	6326.640	6984.590	6984.590	6984.590	6984.590
Financial costs	0.000	15484.000	12261.670	9039.033	5816.999
Total production costs	49557.980	90439.750	119983.500	149391.600	199472.300
Costs per unit (single product)	75.088	69.569	57.135	53.354	50.890
Of it foreign, %	30.202	36.421	36.860	37.492	38.612
Of it variable,%	46.296	52.436	66.524	74.494	81.489
Total labour	2236.840	1812.510	1516.378	1895.263	2490.085

Total Production Costs in thousand USD

Year	2003	2004	2005	2006	2007
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	189566.100	199044.400	208996.600	219446.400	230418.700
Other raw materials	16820.000	16820.000	16820.000	16820.000	16820.000
Utilities	8129.912	8536.407	8963.228	9411.389	9881.957
Energy	395.647	415.430	436.201	458.011	480.912
Labour, direct	2386.646	2505.979	2631.277	2762.841	2900.983
Repair, maintenance	8257.541	3109.021	10370.330	3427.696	3599.080
Spares	480.122	1610.907	518.059	538.462	559.885
Factory overheads	11065.360	11618.630	12199.560	12809.540	13450.010
Factory costs	237101.300	243660.300	260935.300	265674.300	278111.500
Administrative overheads	5347.619	5615.000	5895.750	6190.536	6500.063
Indir. costs, sales and distribution	1403.909	1474.105	1547.810	1625.201	1706.460
Direct costs, sales and distribution	2999.281	3149.250	3306.688	3472.031	3645.594
Depreciation	6984.590	6984.590	6984.590	6984.590	6984.590
Financial costs	2594.666	1297.333	0.000	0.000	0.000
Total production costs	256431.400	262181.000	278670.100	283946.700	296948.300
Costs per unit (single product)	51.286	52.436	55.734	56.789	59.390
Of it foreign, %	38.307	39.687	38.714	39.823	39.915
Of it variable,%	34.557	36.472	35.079	37.336	37.364
Total labour	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Total Production Costs in thousand USD

Year	2008	2009	2010	2011	2012
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	241939.600	254036.600	266738.400	280075.300	294079.100
Other raw materials	16820.000	16820.000	16820.000	16820.000	16820.000
Utilities	10376.050	10894.860	11439.600	12011.580	12612.160
Energy	504.957	530.205	556.715	584.551	613.778
Labour, direct	3046.032	3198.333	3358.250	3526.162	3702.470
Repair, maintenance	3779.034	3967.986	4166.385	4374.704	4593.438
Spares	582.379	605.998	630.798	656.838	684.180
Factory overheads	14122.510	14828.640	15570.070	16348.570	17166.000
Factory costs	291170.600	304882.600	319280.200	334397.700	350271.100
Administrative overheads	6825.066	7166.319	7524.634	7900.866	8295.908
Indir. costs, sales and distribution	1791.783	1881.372	1975.441	2074.213	2177.924
Direct costs, sales and distribution	3827.906	4019.313	4220.313	4431.250	4652.375
Depreciation	6984.590	6984.590	6984.590	6984.590	6706.234
Financial costs	0.000	0.000	0.000	0.000	0.000
Total production costs	310599.900	324934.200	339985.200	355788.600	372104.100
Costs per unit (single product)	62.120	64.987	67.997	71.158	74.421
Of it foreign, %	40.004	40.088	40.170	40.248	40.270
Of it variable, %	[illegible]	37.419	37.444	37.469	37.558
Total labour	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Net Working Capital in thousand USD

Year	adc	coto	1998	1999	2000	2001	2002
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	3974.279	6435.096	9569.768	12930.640	17980.930
Inventory and materials	58	6.3	7396.180	11247.310	16402.920	21382.370	29425.350
Energy	1	360.0	0.413	0.503	0.619	0.734	0.909
Spares	165	2.2	172.500	179.750	187.362	195.356	513.702
Work in progress	15	24.0	1569.223	2567.006	3906.600	5230.921	7378.232
Finished products	15	24.0	1743.806	2750.319	4099.078	5433.023	7590.439
Cash in hand	15	24.0	701.004	716.083	738.953	791.433	982.610
Total current assets			15557.400	23896.060	34905.300	45964.970	63772.180
Current liabilities and							
Accounts payable	30	12.0	3138.445	5134.013	7813.199	10461.840	14756.460
Net working capital			12418.960	18762.050	27092.100	35503.130	49015.710
Increase in working capital			11968.960	6343.093	8330.051	8411.023	13512.590
Net working capital, local			6582.583	10247.110	15035.880	19855.880	27332.950
Net working capital, foreign			5836.375	8514.947	12056.220	15647.250	21682.760

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year	adc	coto	2003	2004	2005	2006	2007
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	23836.010	24423.260	25905.460	26345.170	27428.540
Inventory and materials	58	6.3	38170.260	39751.110	41410.990	43153.380	44982.900
Energy	1	360.0	1.099	1.154	1.212	1.272	1.336
Spares	165	2.2	212.561	777.953	231.530	241.731	252.443
Work in progress	15	24.0	9879.221	10152.530	10872.300	11069.760	11587.380
Finished products	15	24.0	10102.040	10386.490	11117.960	11327.700	11858.320
Cash in hand	15	24.0	1147.387	1019.147	1317.291	1072.045	1125.417
Total current assets			83348.580	86511.640	90856.750	93211.570	97238.520
Current liabilities and							
Accounts payable	30	12.0	19758.440	20305.060	21744.600	22139.530	23175.960
Net working capital			63590.140	66206.580	69112.150	71072.050	74062.560
Increase in working capital			14574.420	2616.441	2905.570	1959.398	2990.516
Net working capital, local			35848.080	36600.910	38974.800	39646.510	41284.420
Net working capital, foreign			27742.040	29605.650	30137.340	31425.540	32778.140

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

Net Working Capital in thousand USD

Year			2008	2009	2010	2011	2012
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	28566.200	29760.800	31015.050	32332.000	33714.910
Inventory and materials	58	6.3	46905.430	48923.030	51041.510	53265.920	55601.550
Energy	1	360.0	1.403	1.473	1.546	1.624	1.705
Spares	165	2.2	263.690	275.499	287.899	300.919	314.590
Work in progress	15	24.0	12132.110	12703.440	13303.340	13933.240	14594.630
Finished products	15	24.0	12416.490	13002.040	13616.870	14262.440	14940.290
Cash in hand	15	24.0	1181.459	1240.303	1302.089	1366.964	1435.083
Total current assets			101466.900	105906.600	110568.200	115463.100	120602.700
Current liabilities and							
Accounts payable	30	12.0	24264.210	25406.880	26606.680	27866.480	29189.260
Net working capital			77202.640	80499.710	83961.610	87596.630	91413.400
Increase in working capital			3140.078	3297.070	3461.898	3635.016	3816.773
Net working capital, local			43004.250	44810.060	46706.180	48697.090	50787.540
Net working capital, foreign			34198.380	35689.640	37255.450	38899.550	40625.860

Note: adc = minimum days of coverage ; coto = coefficient of turnover

Source of Finance, construction in thousand USD

Year	1995
Equity, ordinary ..	0.000
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	70000.000
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	55600.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	125600.000
Current liabilities	0.000
Bank overdraft	0.000
Total funds	125600.000

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Source of Finance, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	-17500.000	-17500.000	-17500.000	-17500.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	-9266.667	-9266.667	-9266.667	-9266.667	-9266.667
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	-26766.670	-26766.670	-26766.670	-26766.670	-9266.667
Current liabilities	3138.445	1995.568	2679.186	2648.644	4294.622	5001.977
Bank overdraft	19753.290	41799.180	24050.190	14635.470	3484.320	-29868.270
Total funds	22891.730	17028.080	-37.293	-9482.554	-18987.730	-34132.960

Prodaction road vehicles AKAKI Ethiopia --- June 1

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Source of Finance, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	-9266.664	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-9266.664	0.000	0.000	0.000	0.000	0.000
Current liabilities	546.622	1439.541	394.924	1036.434	1088.255	1142.668
Bank overdraft	-48226.410	-22327.770	0.000	0.000	0.000	0.000
Total funds	-56946.450	-20888.220	394.924	1036.434	1088.255	1142.668

Prodaction road vehicles AKAKI Ethiopia --- June 1

Source of Finance, production in thousand USD

Year	2010	2011	2012
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	0.000	0.000	0.000
Current liabilities	1199.801	1259.791	1322.782
Bank overdraft	0.000	0.000	0.000
Total funds	1199.801	1259.791	1322.782

COMFAR 2.1 UNIDO

Cashflow Tables, construction in thousand USD

Year	1995	1996	1997
Total cash inflow	125600.000	0.000	0.000
Financial resources	125600.000	0.000	0.000
Sales, net of tax	0.000	0.000	0.000
Total cash outflow	13415.000	43815.000	54810.000
Total assets	13415.000	43815.000	54810.000
Operating costs	0.000	0.000	0.000
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	0.000	0.000	0.000
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	112185.000	-43815.000	-54810.000
Cumulated cash balance	112185.000	68370.000	13560.000
Inflow, local	55600.000	0.000	0.000
Outflow, local	9145.000	20675.000	23580.000
Surplus (deficit)	46455.000	-20675.000	-23580.000
Inflow, foreign	70000.000	0.000	0.000
Outflow, foreign	4270.000	23140.000	31230.000
Surplus (deficit)	65730.000	-23140.000	-31230.000
Net cashflow	-13415.000	-43815.000	-54810.000
Cumulated net cashflow	-13415.000	-57230.000	-112040.000

COMFAR 2.1 UNIDO

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Cashflow tables, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Total cash inflow	38575.450	76761.310	131689.200	185468.300	269012.600	365266.100
Financial resources	3138.445	1995.568	2679.186	5948.644	4294.622	5001.977
Sales, net of tax	35437.000	74765.740	129010.000	179519.600	264717.900	360264.200
Total cash outflow	71888.750	118560.500	155739.400	196803.800	272496.900	335397.300
Total assets	28657.400	8338.666	11009.230	11059.670	17807.210	19576.390
Operating costs	43231.340	67971.160	100737.200	133367.700	185671.200	246852.100
Cost of finance	0.000	15484.000	12261.670	9039.333	5816.999	2594.666
Repayment	0.000	26766.670	26766.670	26766.670	26766.670	9266.667
Corporate tax	0.000	0.000	4964.592	16570.440	36434.850	57108.040
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	-33313.300	-41799.170	-24050.190	-11335.480	-3484.344	29868.810
Cumulated cash balance	-19753.300	-61552.480	-85602.660	-96938.150	-100422.500	-70554.180
Inflow, local	37638.990	63924.020	105087.700	140384.500	198542.500	249203.200
Outflow, local	48038.340	68706.040	93436.710	122640.100	174521.000	233233.300
Surplus (deficit)	-10399.360	-4782.023	11650.950	17744.370	24020.590	15969.420
Inflow, foreign	936.463	12837.290	26601.510	45083.780	70470.050	116062.900
Outflow, foreign	23850.400	49854.450	62302.650	74163.640	97974.970	102164.000
Surplus (deficit)	-22913.940	-37017.160	-35701.130	-29079.860	-27504.920	13898.940
Net cashflow	-33313.300	-41799.190	-24050.190	-11335.480	-3484.344	29868.810
Cumulated net cashflow	-145050.300	-144901.300	-129923.700	-108753.100	-79653.330	-37924.200

Prodaction road vehicles AKAKI Ethiopia --- June

Cashflow tables, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Total cash inflow	380783.000	402646.700	423652.300	447383.200	471711.300	497255.900
Financial resources	546.622	1439.541	425.764	1036.434	1088.255	1142.668
Sales, net of tax	380236.400	401207.200	423226.500	446346.800	470623.100	496113.300
Total cash outflow	332556.600	343425.900	355951.700	376159.900	395856.400	416537.800
Total assets	3163.066	4345.103	2354.821	4026.968	4228.320	4439.733
Operating costs	253899.100	271685.400	276962.100	289963.700	303615.300	317949.600
Cost of finance	1297.333	0.000	0.000	0.000	0.000	0.000
Repayment	9266.664	0.000	30.840	0.000	0.000	0.000
Corporate tax	64930.450	67395.420	76603.900	82169.210	88012.740	94148.480
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	48226.410	59220.780	67700.590	71223.340	75854.940	80718.090
Cumulated cash balance	-22327.770	36893.010	104593.600	175816.900	251671.900	332390.000
Inflow, local	259698.400	274934.000	288692.600	304911.500	321352.100	338614.700
Outflow, local	230216.200	238751.600	245216.300	259887.800	273770.700	288347.800
Surplus (deficit)	29482.250	36182.390	43476.280	45023.780	47581.440	50266.880
Inflow, foreign	121084.500	127712.800	134959.700	142471.700	150359.300	158641.200
Outflow, foreign	102340.400	104674.400	110735.400	116272.100	122085.700	128190.000
Surplus (deficit)	18744.100	23038.350	24224.240	26199.540	28273.510	30451.100
Net cashflow	48226.350	59220.770	67700.630	71223.350	75854.950	80718.090
Cumulated net cashflow	20866.100	80086.900	147787.600	219010.900	294865.900	375584.000

Cashflow tables, production in thousand USD

Year	2010	2011	2012
Total cash inflow	524077.700	552240.600	581811.600
Financial resources	1199.801	1259.791	1322.782
Sales, net of tax	522877.900	550980.800	580488.800
Total cash outflow	438253.300	461054.600	485149.000
Total assets	4661.720	4894.803	5139.550
Operating costs	333000.600	348804.100	365397.800
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	100591.000	107355.700	114611.600
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	85824.380	91186.000	96662.590
Cumulated cash balance	418214.300	509400.300	606062.900
Inflow, local	356740.400	375772.400	395756.000
Outflow, local	303653.800	319725.100	336753.000
Surplus (deficit)	53086.590	56047.380	59003.000
Inflow, foreign	167337.300	176468.100	186055.500
Outflow, foreign	134599.500	141329.500	148396.000
Surplus (deficit)	32737.791	35138.500	37659.550
Net cashflow	85824.350	91186.000	96662.550
Cumulated net cashflow	461408.300	552594.300	649256.900

COMFAR
2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Cashflow Discounting:

a) Equity paid versus Net income flow:

Net present value	178683.70	at	11.50 %
Internal Rate of Return (IRRE1) ..	59.13 %		

b) Net Worth versus Net cash return:

Net present value	116849.10	at	11.50 %
Internal Rate of Return (IRRE2) ..	25.07 %		

c) Internal Rate of Return on total investment:

Net present value	111555.00	at	11.50 %
Internal Rate of Return (IRR) ..	19.30 %		

Net Worth = Equity paid plus reserves

Net Income Statement in thousand USD

Year	1998	1999	2000	2001	2002
Total sales, incl. sales tax	39897.000	84015.740	143110.000	201319.600	294817.900
Less: variable costs, incl. sales tax.	27403.340	56711.750	94024.480	133319.700	192216.500
Variable margin	12493.660	27303.990	49085.520	67999.890	102601.500
As % of total sales	31.315	32.499	34.299	33.777	34.802
Non-variable costs, incl. depreciation	26614.640	27493.990	27797.320	28832.490	30539.280
Operational margin	-14120.980	-190.000	21288.200	39167.400	72062.190
As % of total sales	-35.394	-0.226	14.875	19.455	24.443
Cost of finance	0.000	15484.000	12261.670	9039.333	5816.999
Gross profit	-14120.980	-15674.000	9026.531	30128.060	66245.190
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	-14120.980	-15674.000	9026.531	30128.060	66245.190
Tax	0.000	0.000	4964.592	16570.440	36434.850
Net profit	-14120.980	-15674.000	4061.939	13557.630	29810.340
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	-14120.980	-15674.000	4061.939	13557.630	29810.340
Accumulated undistributed profit	-14120.980	-29794.980	-25733.040	-12175.420	17634.920
Gross profit, % of total sales	-35.394	-18.656	6.307	14.965	22.479
Net profit, % of total sales	-35.394	-18.656	2.838	6.734	10.111
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	-10.265	-0.132	10.723	14.067	20.457

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Net Income Statement in thousand USD

Year	2003	2004	2005	2006	2007
Total sales, incl. sales tax	399444.200	419416.400	440387.200	462406.500	485526.800
Less: variable costs, incl. sales tax.	256659.500	266692.500	277227.100	288288.400	299902.800
Variable margin	142784.600	152723.900	163160.100	174118.100	185624.000
As % of total sales	35.746	36.413	37.049	37.655	38.231
Non-variable costs, incl. depreciation	36357.160	33371.180	40622.970	34838.250	36225.410
Operational margin	106427.500	119352.700	122537.100	139279.800	149398.600
As % of total sales	26.644	28.457	27.825	30.121	30.770
Cost of finance	2594.666	1297.333	0.000	0.000	0.000
Gross profit	103832.800	118055.400	122537.100	139279.800	149398.600
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	103832.800	118055.400	122537.100	139279.800	149398.600
Tax	57108.040	64930.450	67395.420	76603.900	82169.210
Net profit	46724.760	53124.910	55141.700	62675.910	67229.350
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	46724.760	53124.910	55141.700	62675.910	67229.350
Accumulated undistributed profit	64359.680	117484.600	172626.300	235302.200	302531.500
Gross profit, % of total sales	25.994	28.148	27.825	30.121	30.770
Net profit, % of total sales	11.697	12.666	12.521	13.554	13.847
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	26.132	28.442	28.087	31.043	33.749

COMFAR
2.1 UNIDO

---------- CONFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA ---

Net Income Statement in thousand USD

Year	2008	2009	2010	2011	2012
Total sales, incl. sales tax	509803.100	535293.300	562057.900	590160.800	619668.800
Less: variable costs, incl. sales tax.	312098.000	324902.900	338348.100	352465.300	367288.700
Variable margin	197705.100	210390.400	223709.800	237695.400	252380.100
As % of total sales	38.781	39.304	39.802	40.276	40.728
Non-variable costs, incl. depreciation	37681.970	39211.310	40817.130	42503.280	43995.380
Operational margin	160023.200	171179.100	182892.700	195192.100	208384.700
As % of total sales	31.389	31.979	32.540	33.074	33.628
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	160023.200	171179.100	182892.700	195192.100	208384.700
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	160023.200	171179.100	182892.700	195192.100	208384.700
Tax	88012.740	94148.480	100591.000	107355.700	114611.600
Net profit	72010.410	77030.590	82301.710	87836.450	93773.120
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	72010.410	77030.590	82301.710	87836.450	93773.120
Accumulated undistributed profit	374541.900	451572.500	533874.300	621710.700	715483.800
Gross profit, % of total sales	31.389	31.979	32.540	33.074	33.628
Net profit, % of total sales	14.125	14.390	14.643	14.883	15.133
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	35.588	37.459	39.360	41.289	43.302

Prodaction road vehicles AKAKI Ethiopia --- June

Projected Balance Sheets, construction in thousand USD

Year	1995	1996	1997
Total assets	125600.000	125600.000	125600.000
Fixed assets, net of depreciation	0.000	12415.000	57220.000
Construction in progress	12415.000	43815.000	54360.000
Current assets	0.000	0.000	450.000
Cash, bank	0.000	0.000	0.000
Cash surplus, finance available	112185.000	68370.000	13560.000
Loss carried forward	0.000	0.000	0.000
Loss	0.000	0.000	0.000
Total liabilities	125600.000	125600.000	125600.000
Equity capital	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000
Profit	0.000	0.000	0.000
Long and medium term debt	125600.000	125600.000	125600.000
Current liabilities	0.000	0.000	0.000
Bank overdraft, finance required	0.000	0.000	0.000
Total debt	125600.000	125600.000	125600.000
Equity, % of liabilities	0.000	0.000	0.000

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

Year	1998	1999	2000	2001	2002
Total assets	148491.700	165519.300	169544.500	169557.600	166822.600
Fixed assets, net of depreciation	105263.400	111823.800	104844.200	97859.580	90874.980
Construction in progress	13550.000	0.000	0.000	0.000	0.000
Current assets	14856.400	23179.980	34166.340	45173.530	62889.560
Cash, bank	701.004	716.083	738.953	791.433	382.610
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	0.000	14120.980	20794.980	25733.040	12175.420
Loss	14120.980	15674.000	0.000	0.000	0.000
Total liabilities	148491.700	165519.300	169544.500	169557.600	166822.600
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000	0.000	0.000
Profit	0.000	0.000	4061.039	13557.630	29810.340
Long and medium term debt	125600.000	98833.330	72066.660	45300.000	18533.330
Current liabilities	3138.445	5134.013	7813.199	10461.840	14756.460
Bank overdraft, finance required	19753.290	61552.470	85602.660	100238.100	103722.500
Total debt	148491.700	165519.300	165482.500	156000.000	137012.300
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

Production road vehicles AKAKI Ethiopia --- June

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

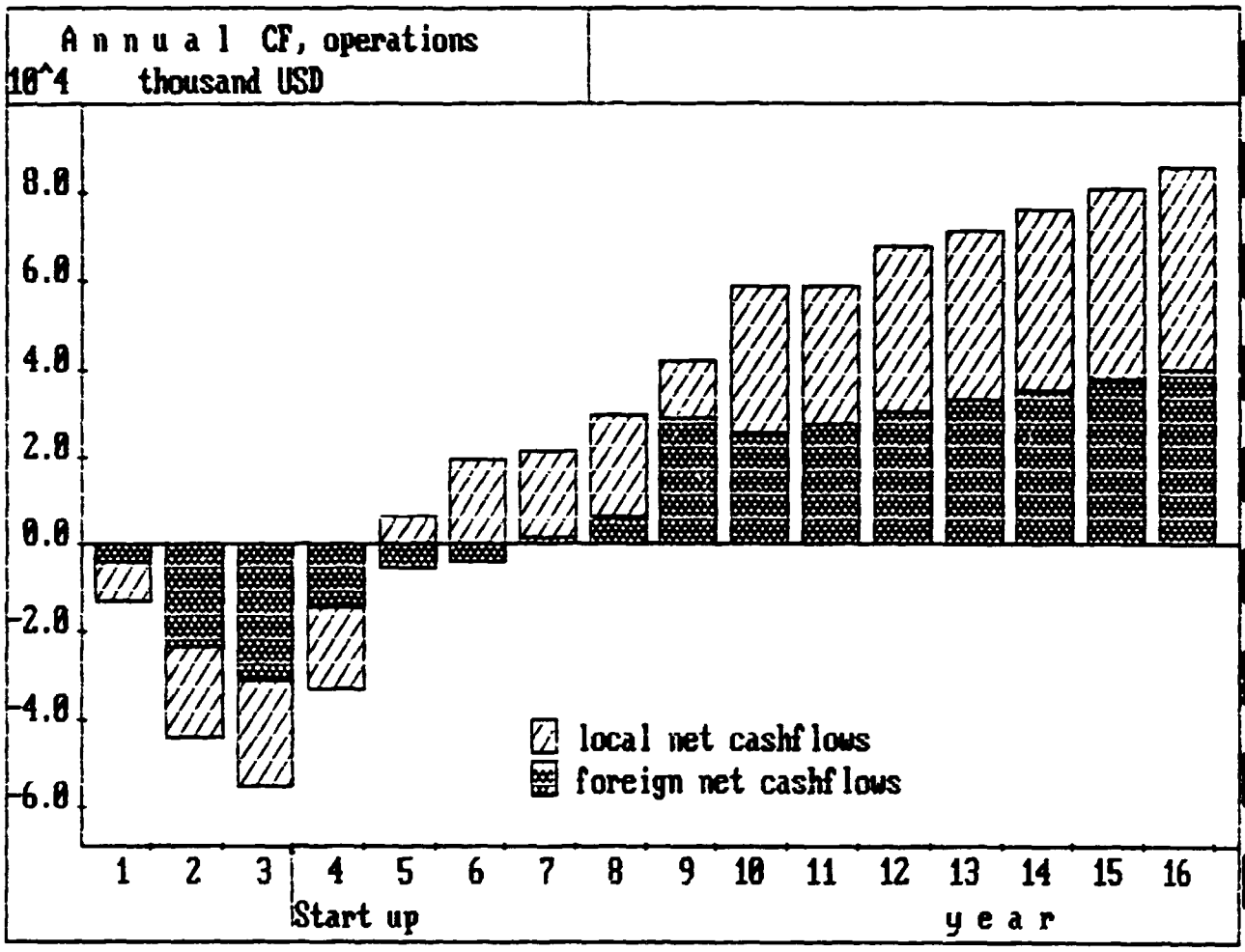
Projected Balance Sheets, Production in thousand USD

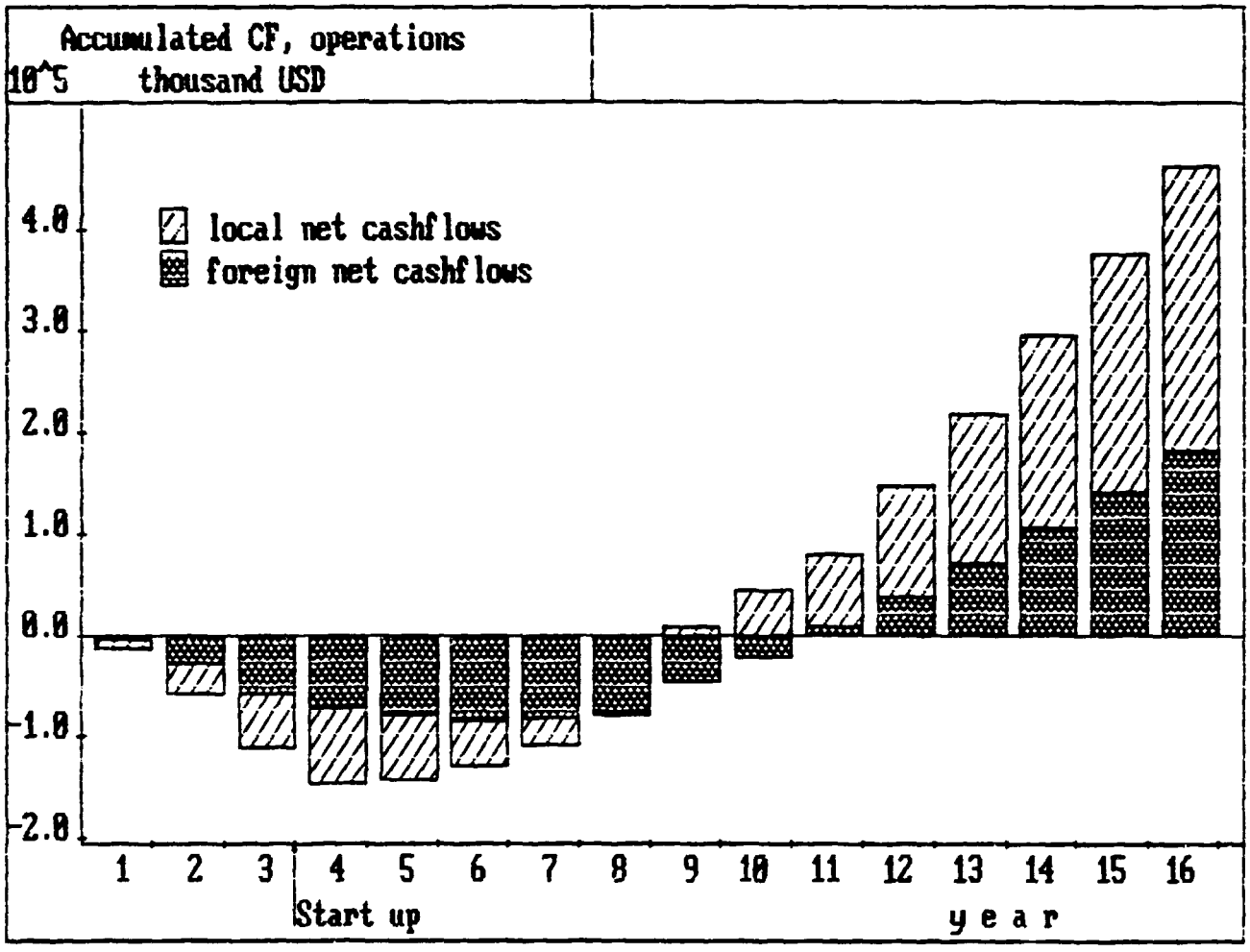
Year	2003	2004	2005	2006	2007
Total assets	167239.000	163417.400	197670.900	260741.700	329007.500
Fixed assets, net of depreciation	83890.390	76905.800	69921.200	62936.610	55952.020
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	82201.180	85492.480	97539.450	92139.520	96113.110
Cash, bank	1147.387	1019.147	1317.291	1072.045	1125.417
Cash surplus, finance available	0.000	0.000	36892.940	104593.500	175817.000
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	167239.000	163417.400	197670.900	260741.700	329007.500
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	17634.920	64359.680	117484.600	172626.300	235302.200
Profit	46724.760	53124.910	55141.700	62675.910	67229.350
Long and medium term debt	9266.661	-0.003	-0.003	-0.003	-0.003
Current liabilities	19758.440	20305.060	21744.660	22139.530	23175.960
Bank overdraft, finance required	73854.170	25627.770	3300.000	3300.000	3300.000
Total debt	102879.300	45932.820	25044.600	25439.520	26475.960
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

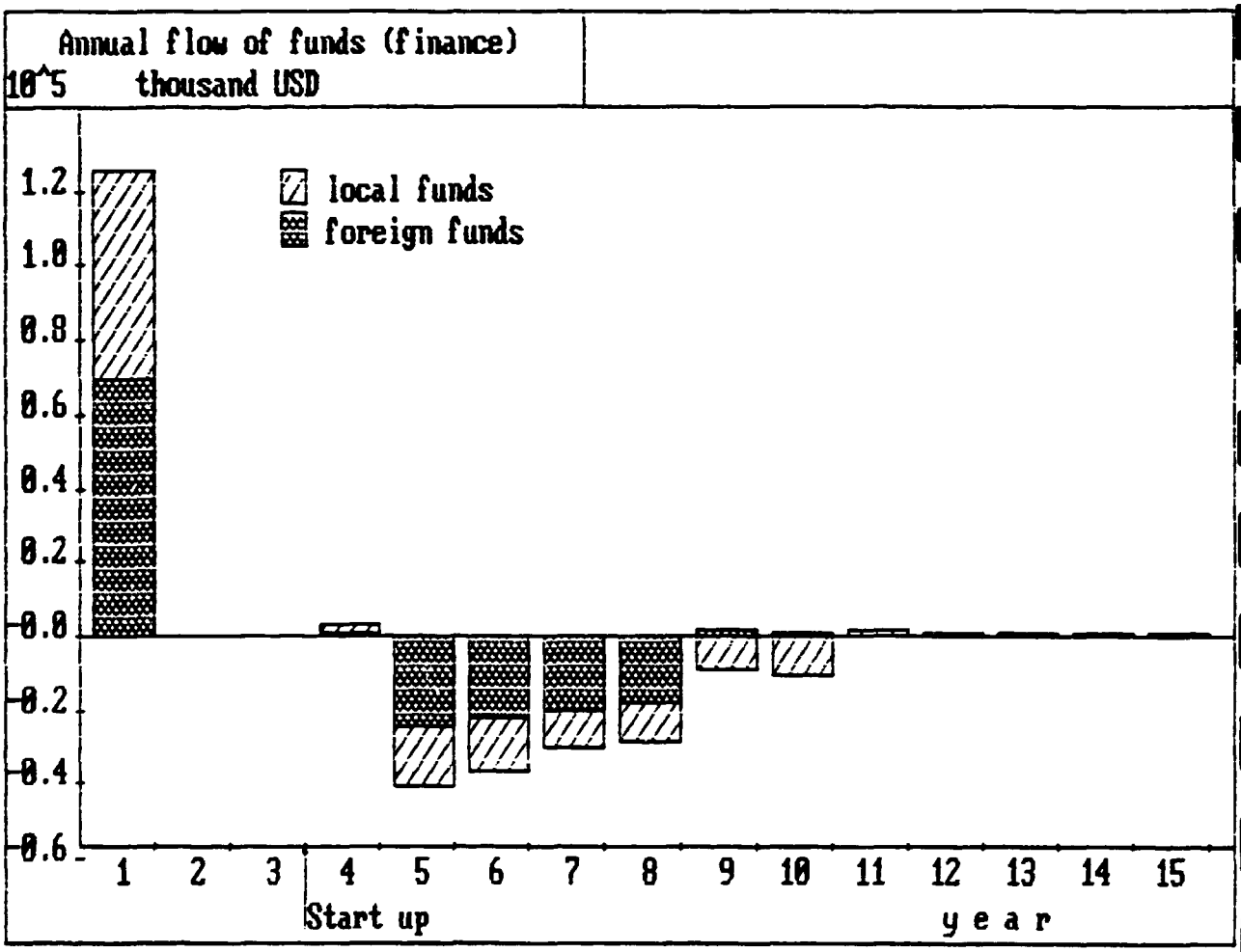
Projected Balance Sheets, Production in thousand USD

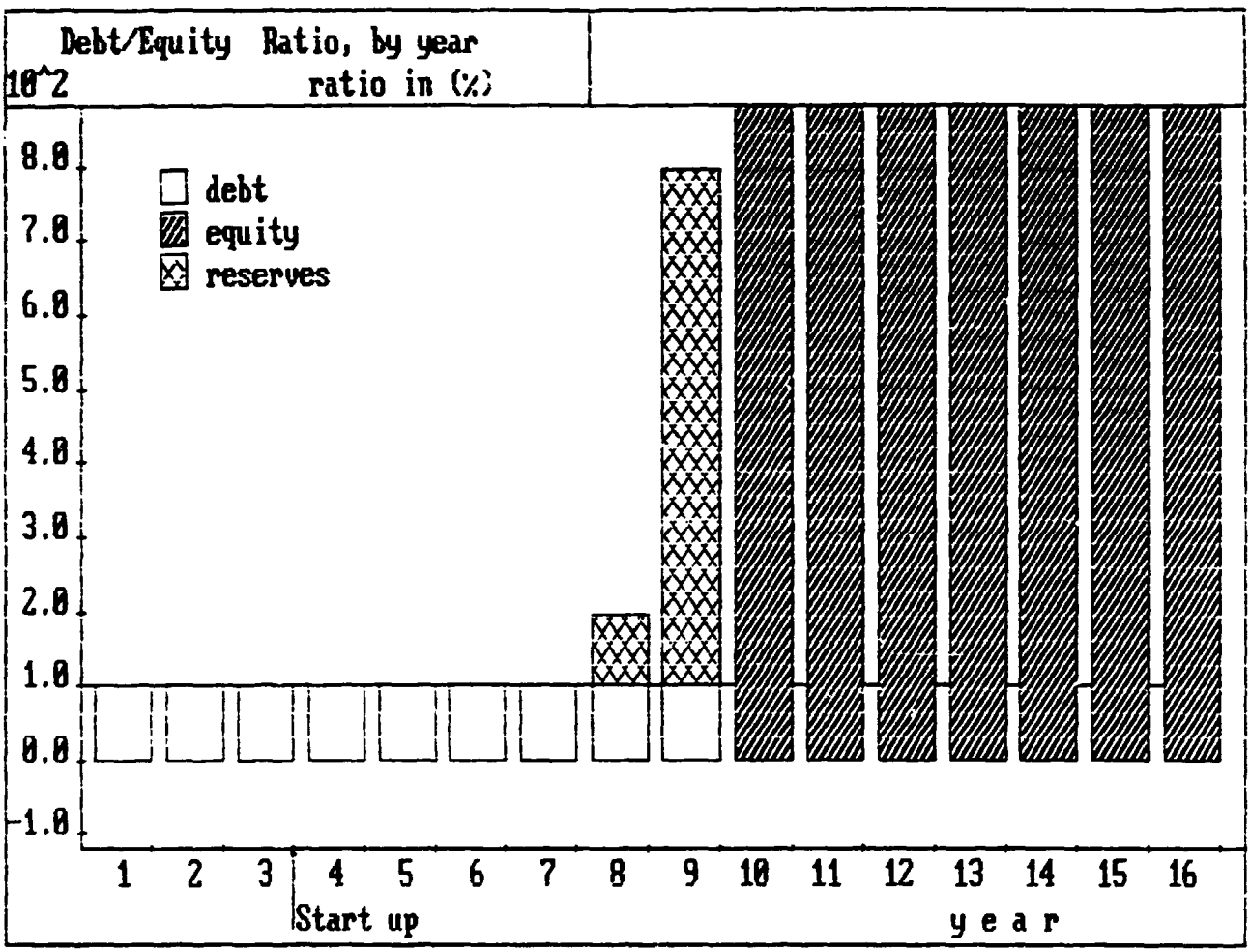
Year	2008	2009	2010	2011	2012
Total assets	402106.200	480279.400	563780.900	652877.200	747973.100
Fixed assets, net of depreciation	48967.430	41982.840	34998.250	28013.660	21307.430
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	100285.400	104666.300	109266.200	114096.100	119167.600
Cash, bank	1181.459	1240.303	1302.089	1366.964	1435.983
Cash surplus, finance available	251671.900	332290.000	418214.400	509400.400	606063.000
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	402106.200	480279.400	563780.900	652877.200	747973.100
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	302531.500	374541.000	451572.500	533874.300	621710.700
Profit	72010.410	77030.590	82301.710	87936.450	93773.120
Long and medium term debt	-0.003	-0.003	-0.003	-0.003	-0.003
Current liabilities	24264.210	25406.880	26606.680	27866.470	29189.260
Bank overdraft, finance required	3300.000	3300.000	3300.000	3300.000	3300.000
Total debt	27564.210	28706.880	29906.680	31166.470	32489.250
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

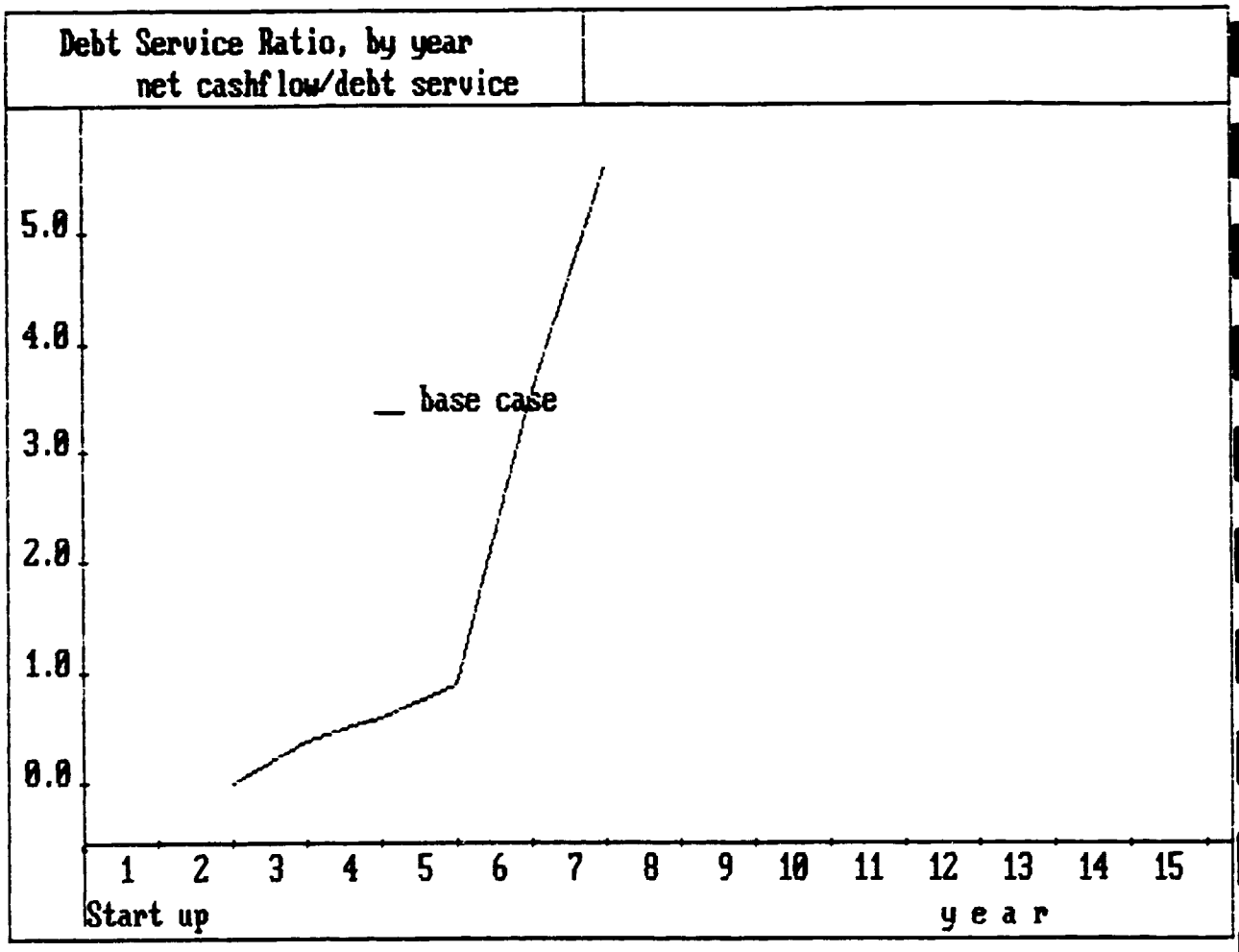
COMFAR


Annual CF, operations
10^4 thousand USD
8.0
6.0
4.0
2.0
0.0
-2.0
-4.0
-6.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
year

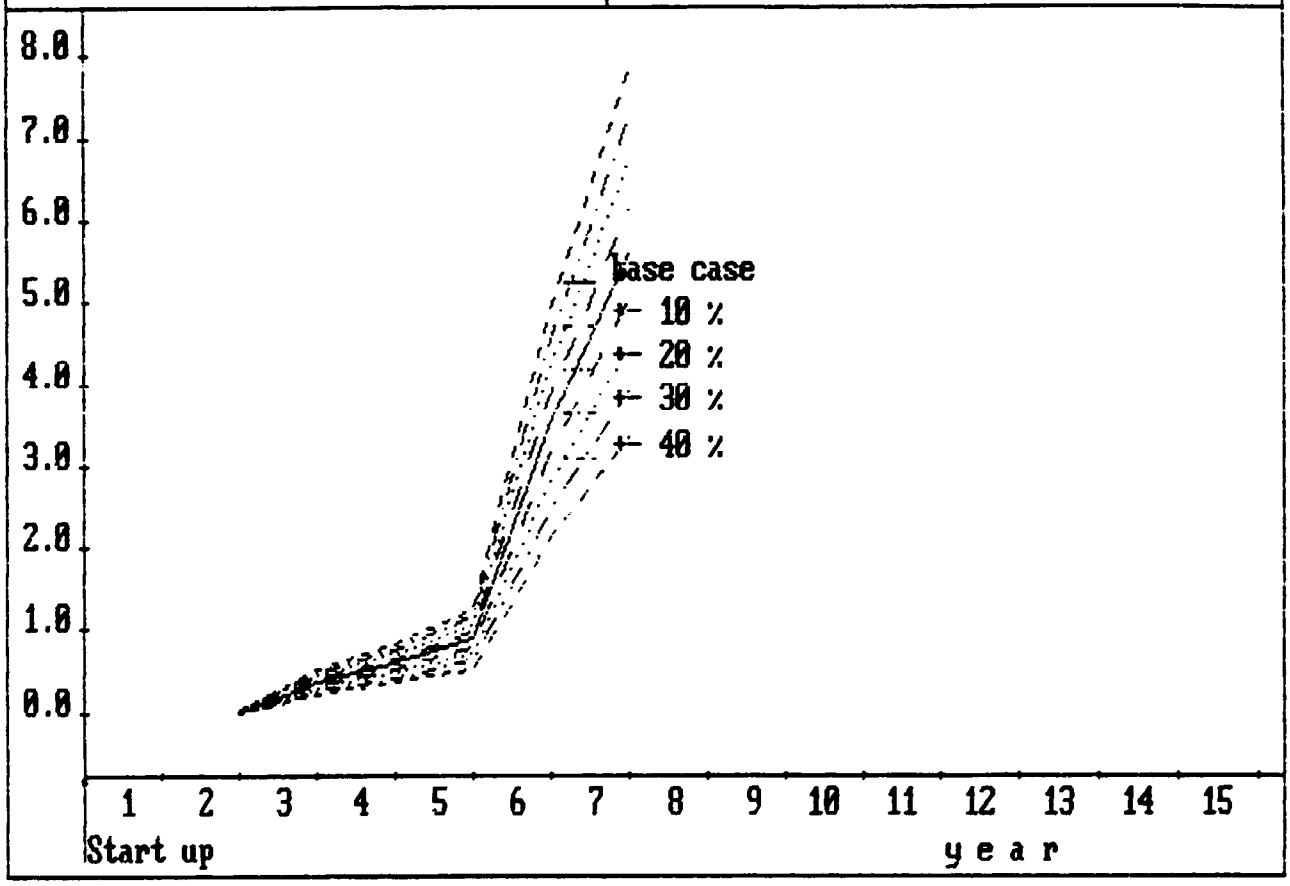

Accumulated CF, operations
10^5 thousand USD
local net cashflows
foreign net cashflows
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year

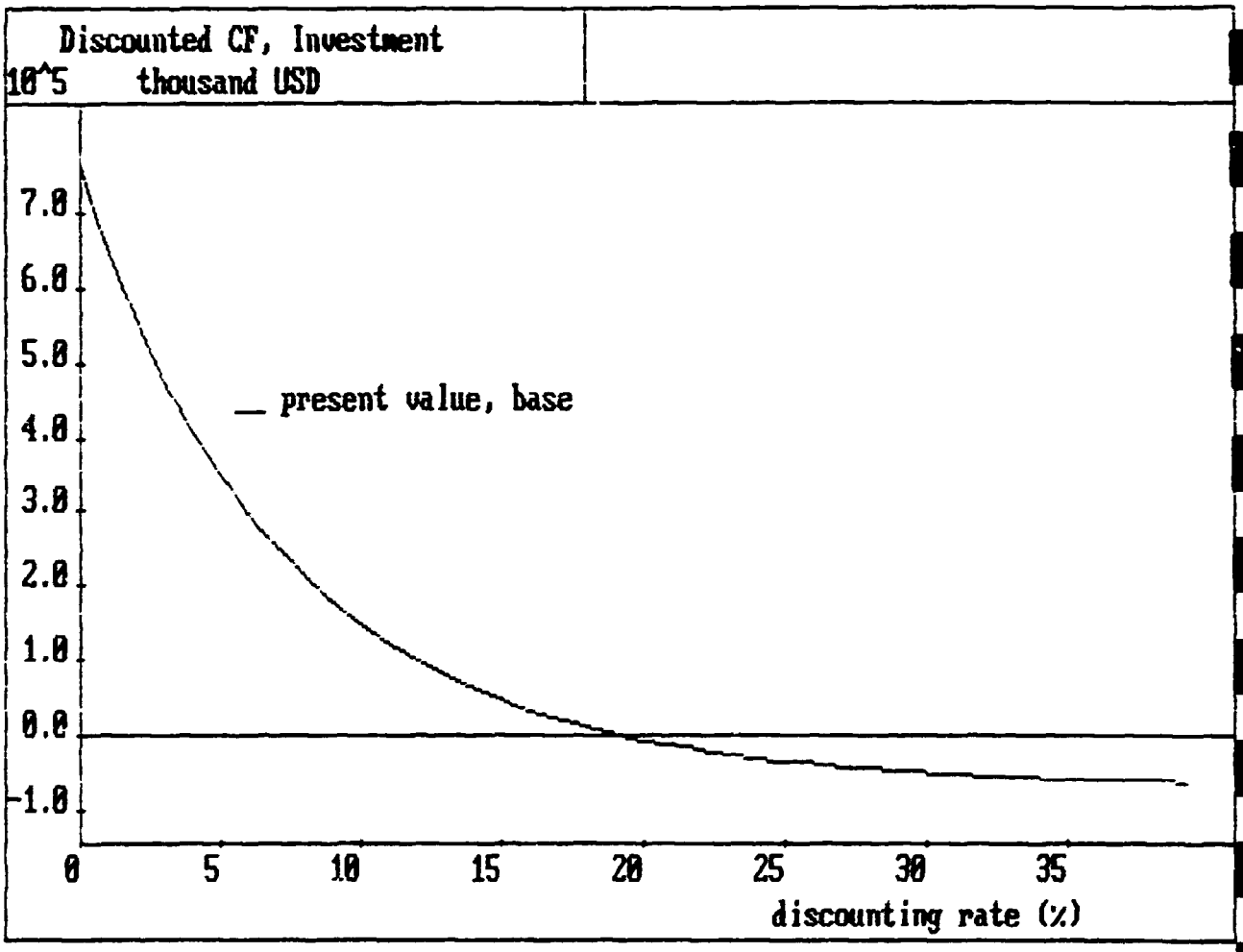

Annual flow of funds (finance)
10^5 thousand USD
local funds
foreign funds
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

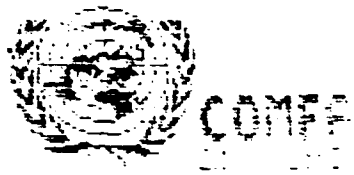

Debt/Equity Ratio, by year
10^2
ratio in (%)
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
debt
equity
reserves
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year

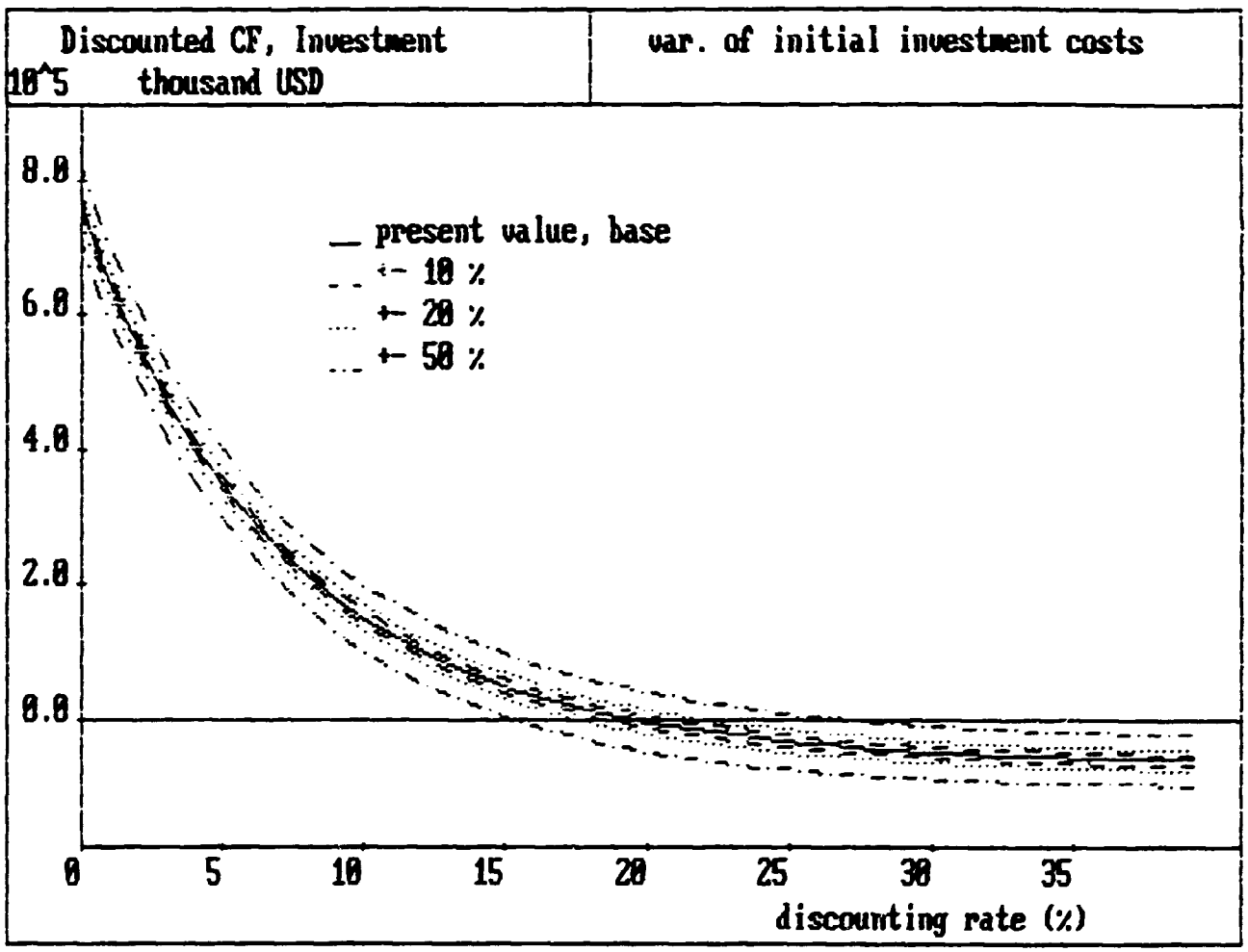

Debt Service Ratio, by year
net cashflow/debt service
5.0
4.0
3.0
2.0
1.0
0.0
base case
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

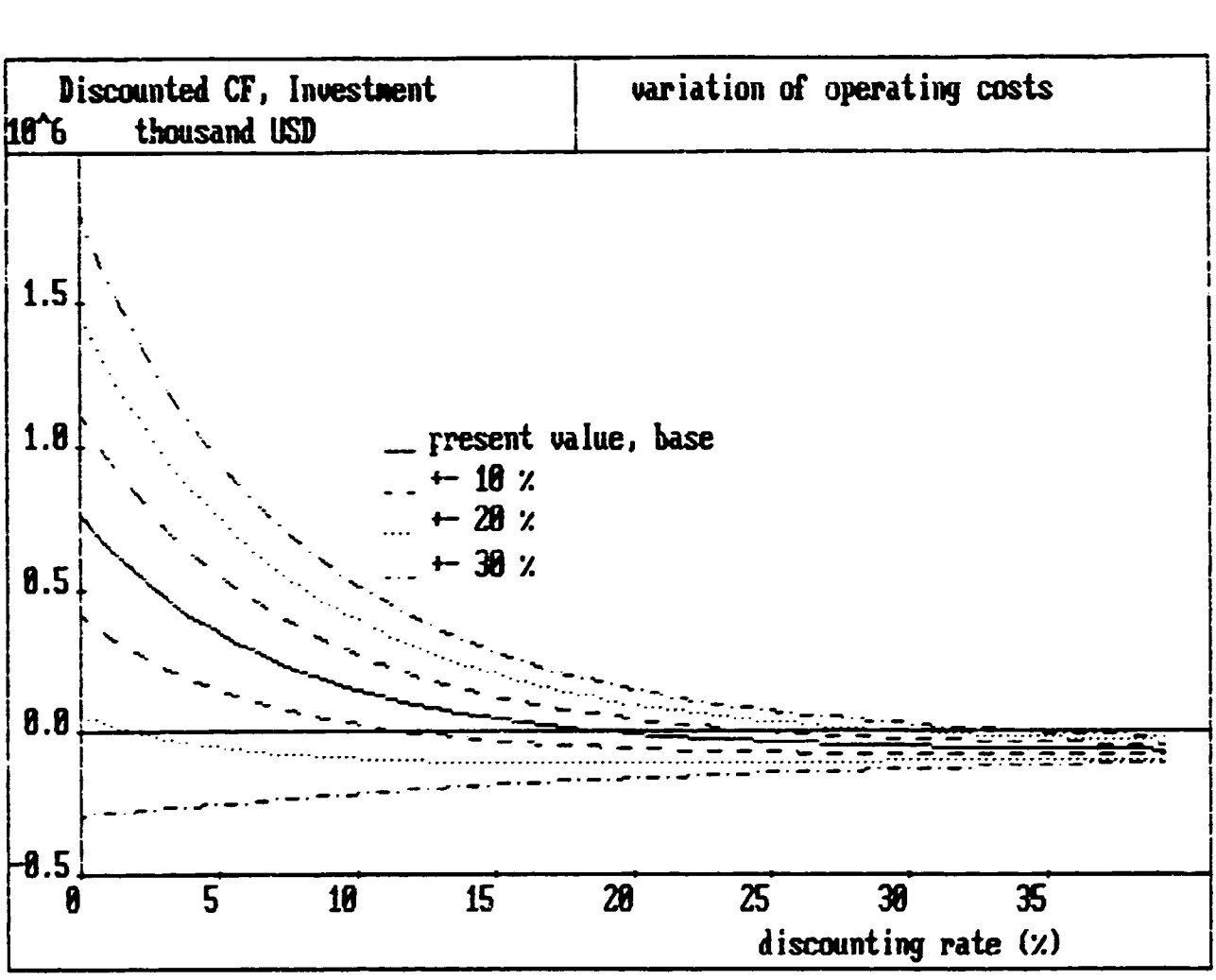
Debt Service Ratio, by year net cashflow/debt service	variation of the net cashflow

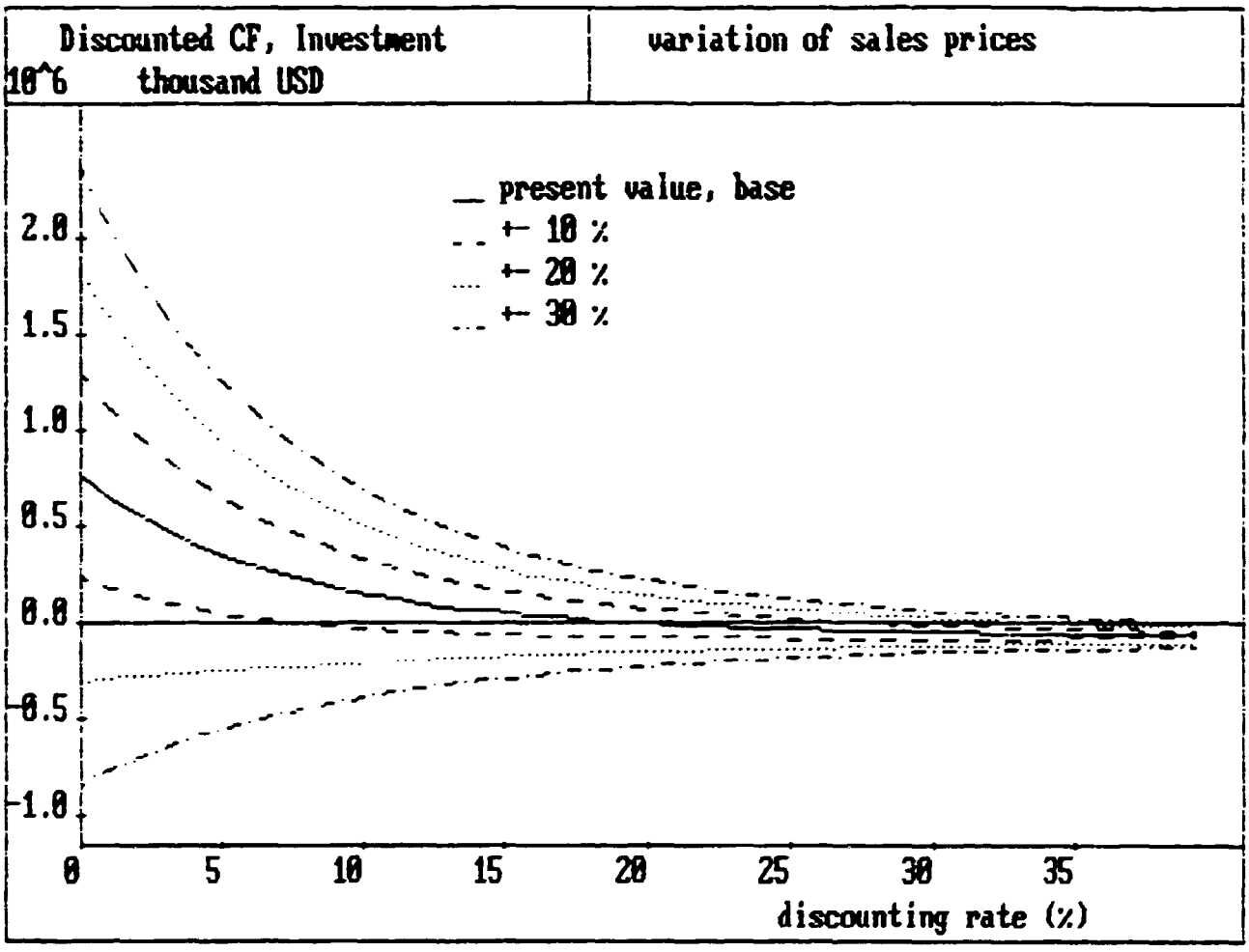


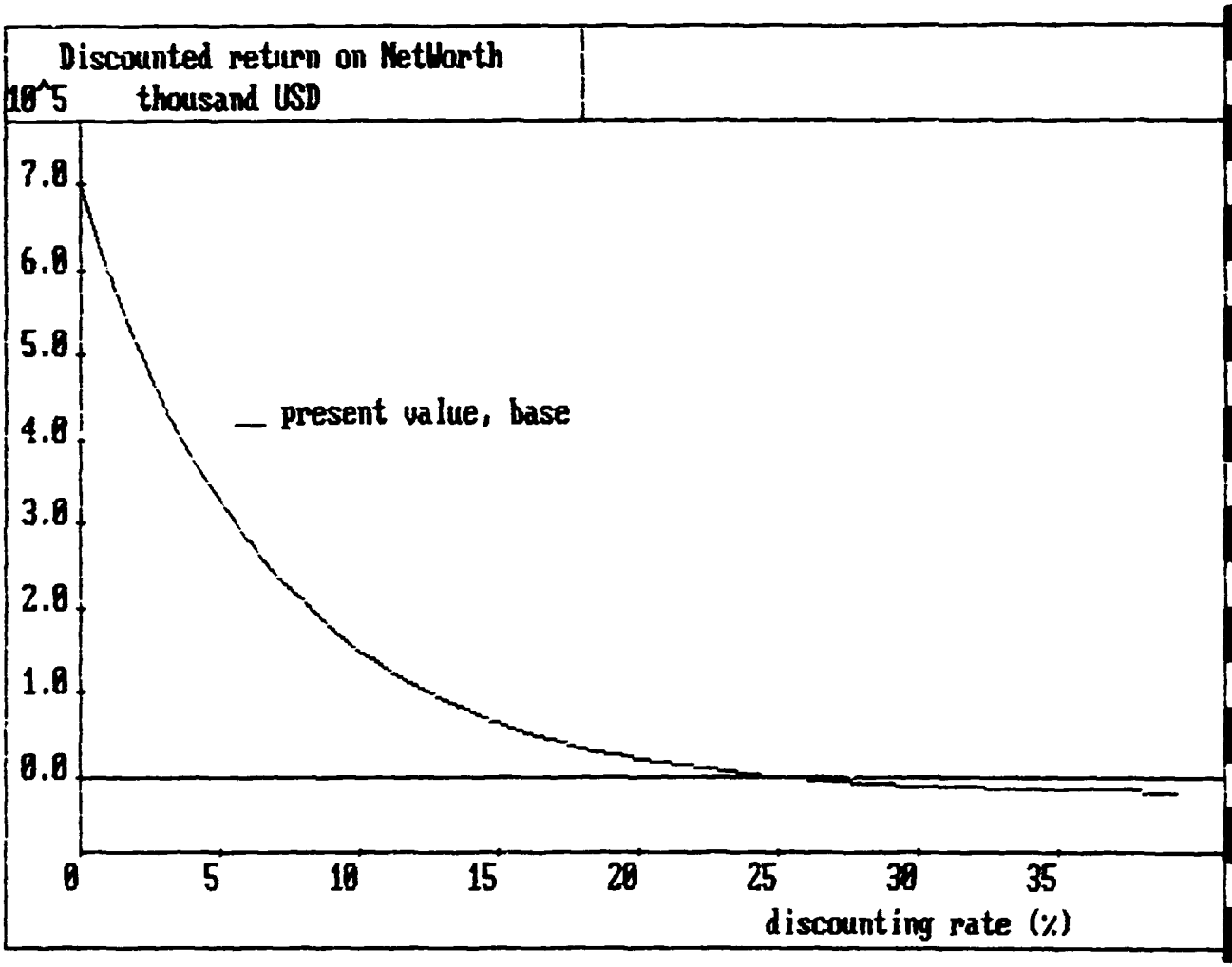

Discounted CF, Investment
10^5 thousand USD
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

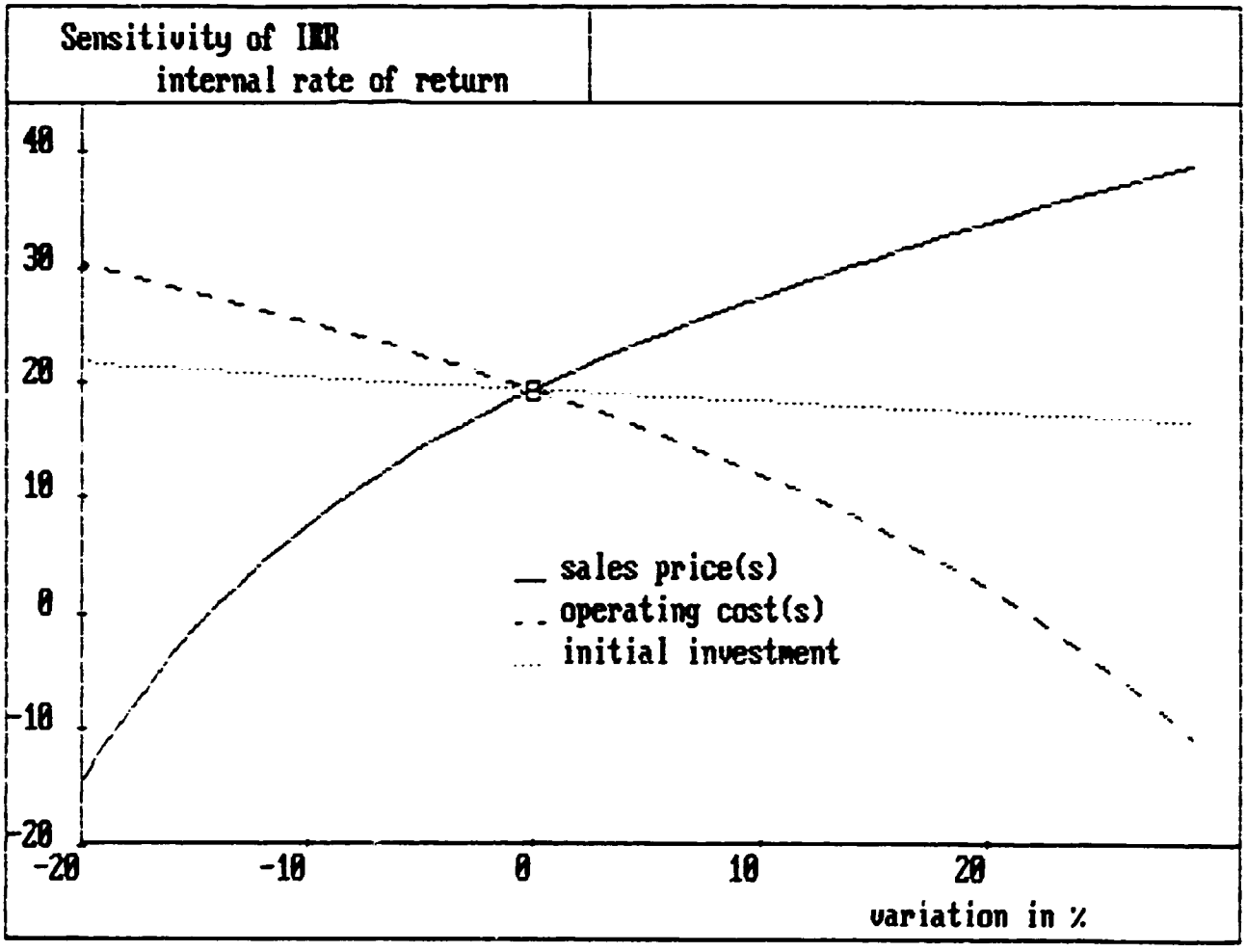


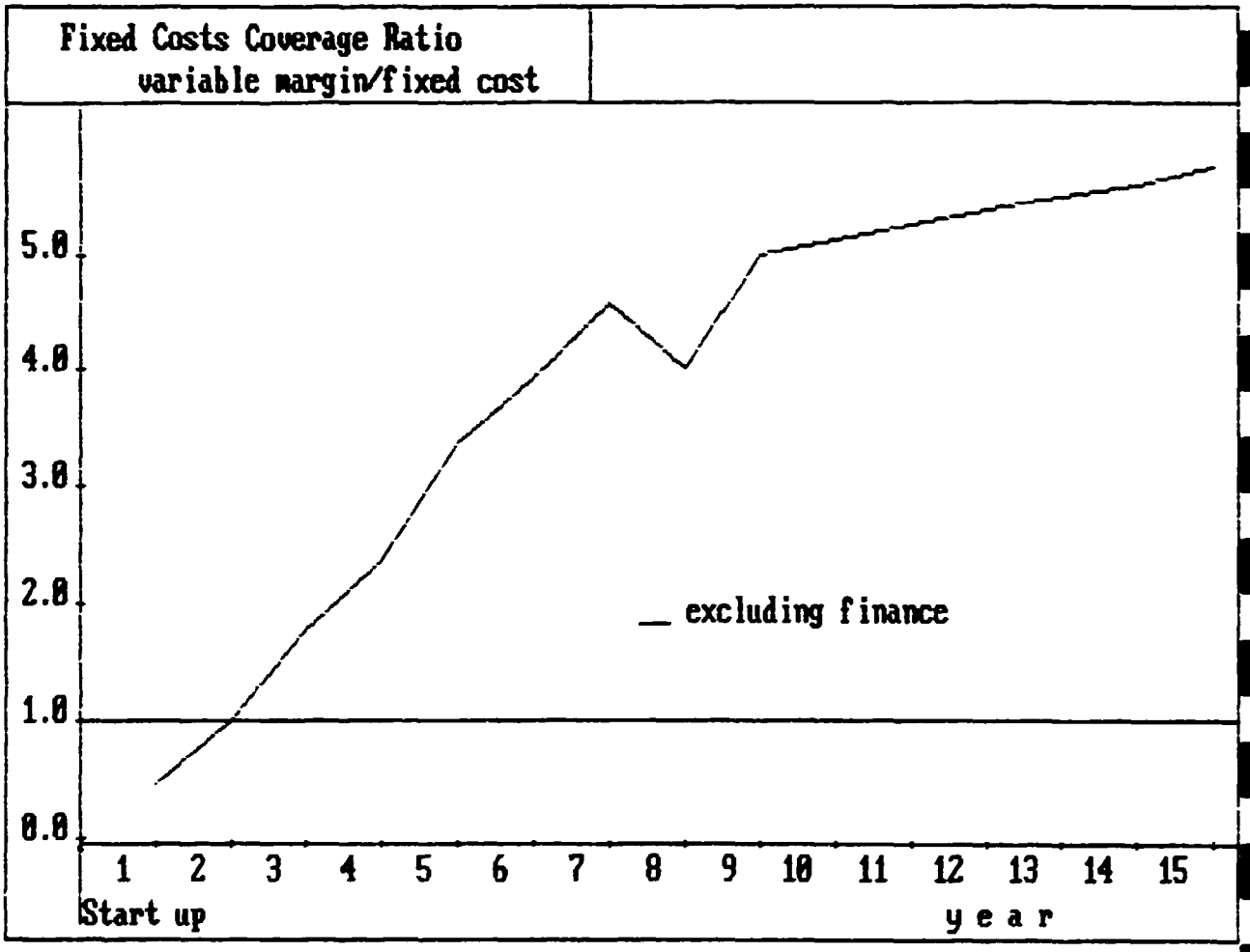

Discounted CF, Investment
10^5 thousand USD
var. of initial investment costs
8.0
6.0
4.0
2.0
0.0
present value, base
+- 10 %
+- 20 %
+- 50 %
0
5
10
15
20
25
30
35
discounting rate (%)

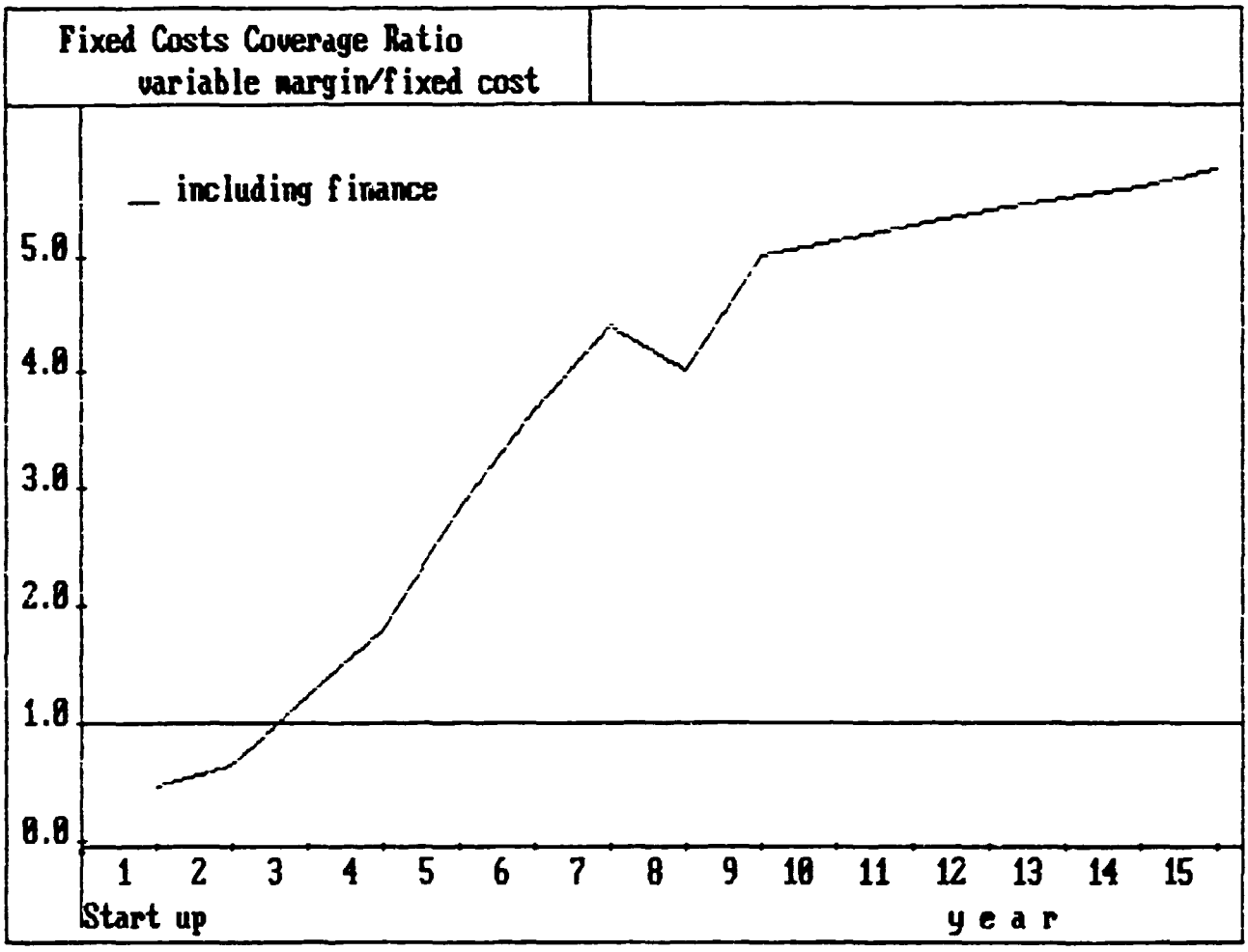


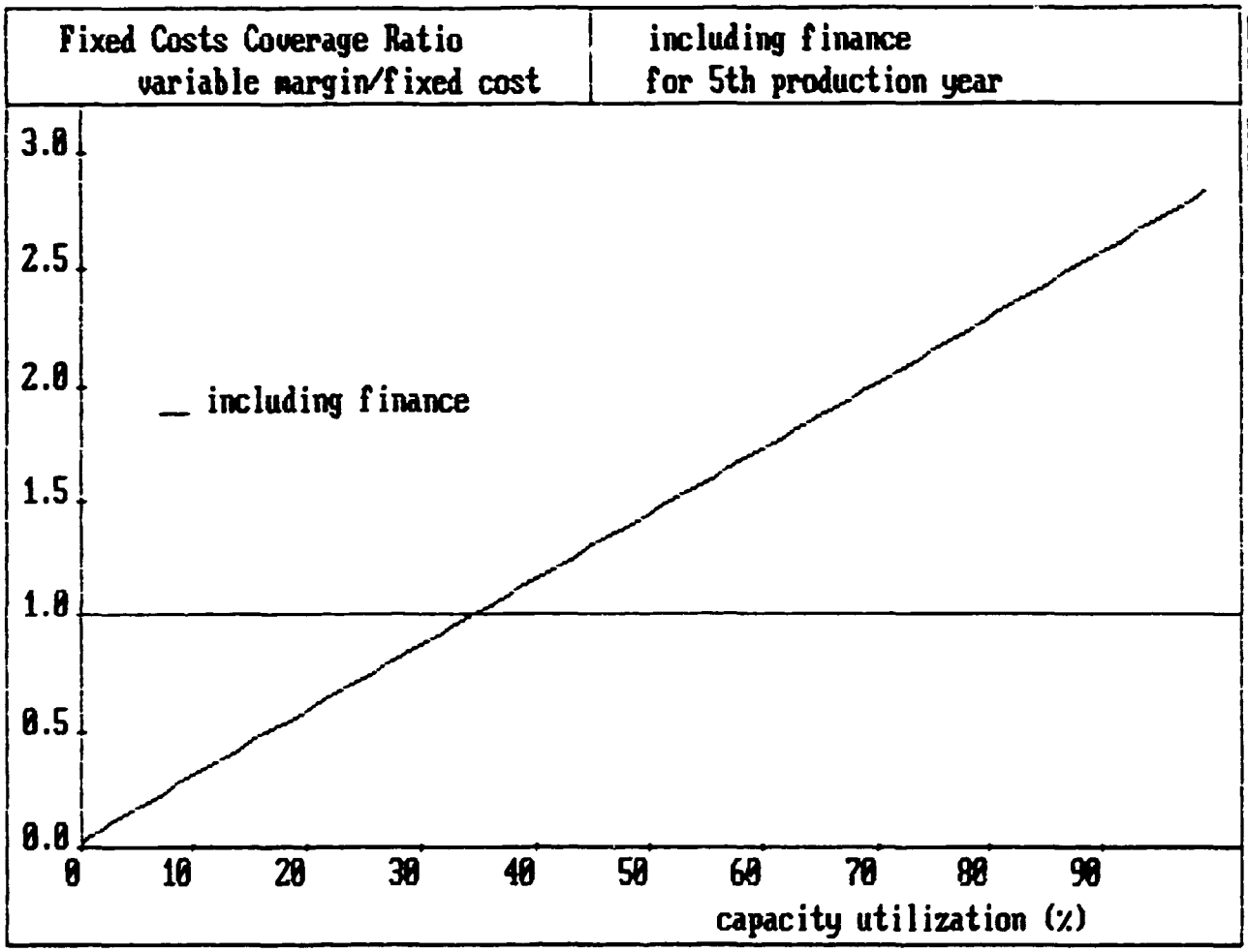

Discounted CF, Investment
10^6 thousand USD
variation of sales prices
present value, base
+- 10 %
+- 20 %
+- 30 %
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
0
5
10
15
20
25
30
35
discounting rate (%)

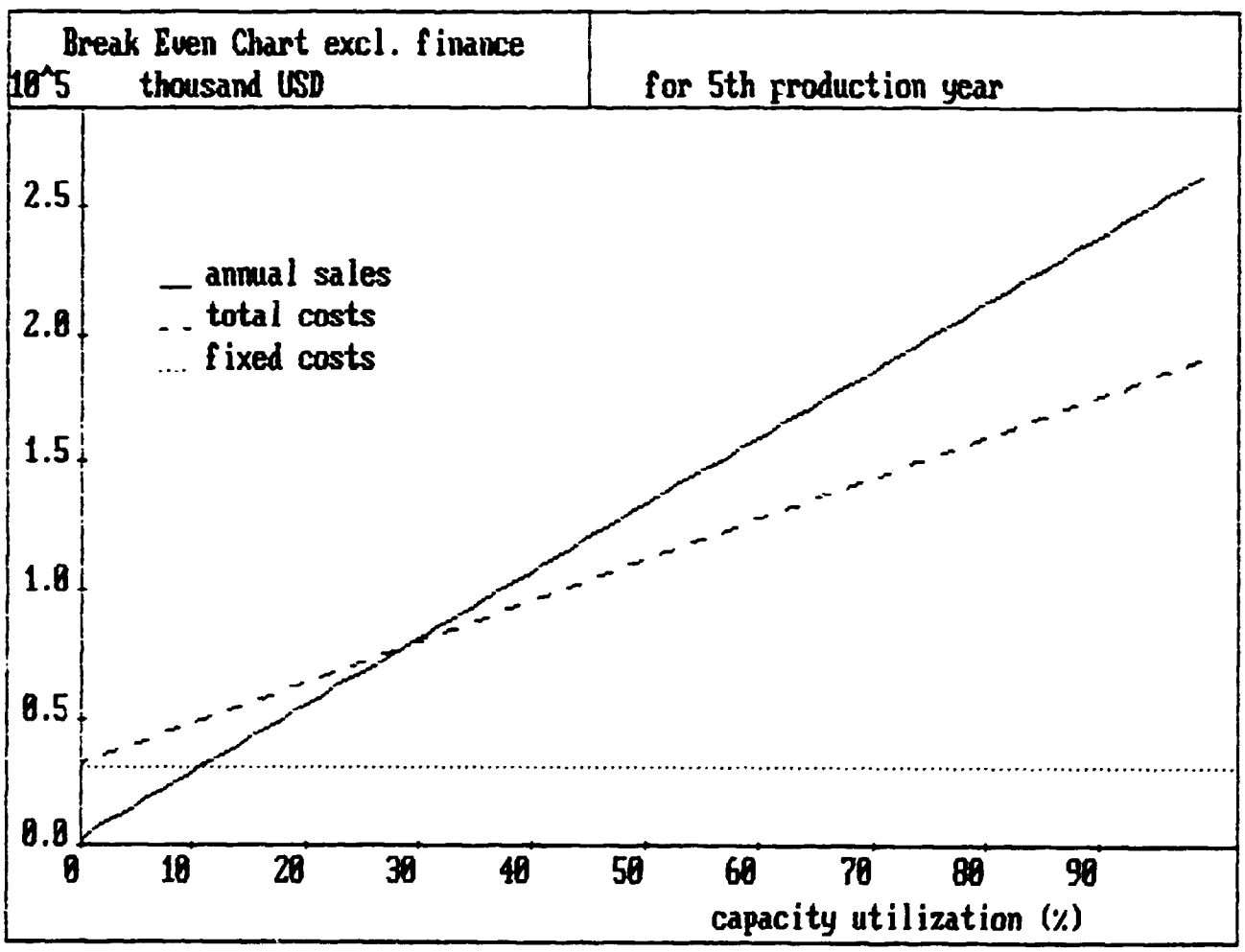


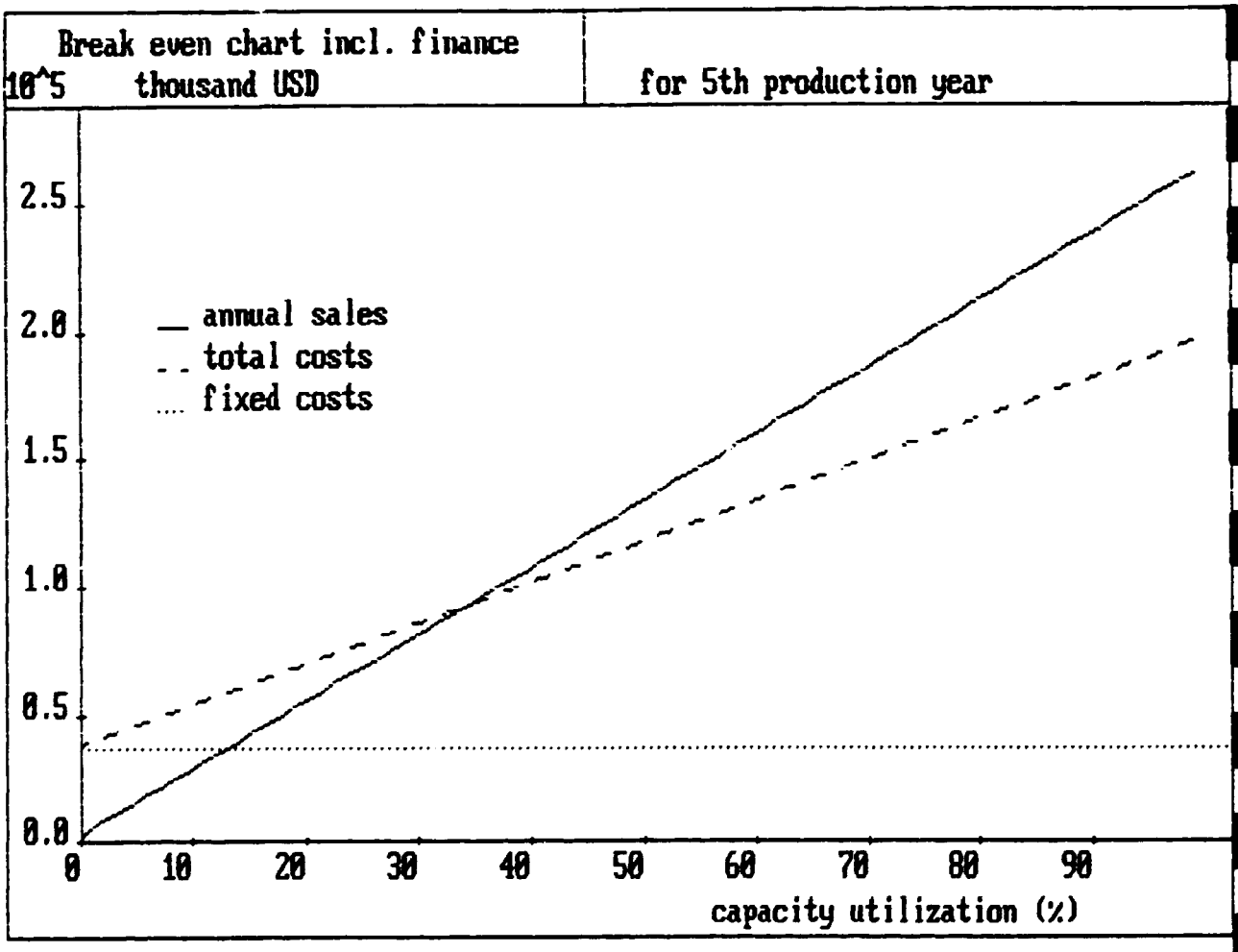

Sensitivity of IRR
internal rate of return
40
30
20
10
0
-10
-20
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment




Fixed Costs Coverage Ratio
variable margin/fixed cost
__ including finance
5.0
4.0
3.0
2.0
1.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
y e a r

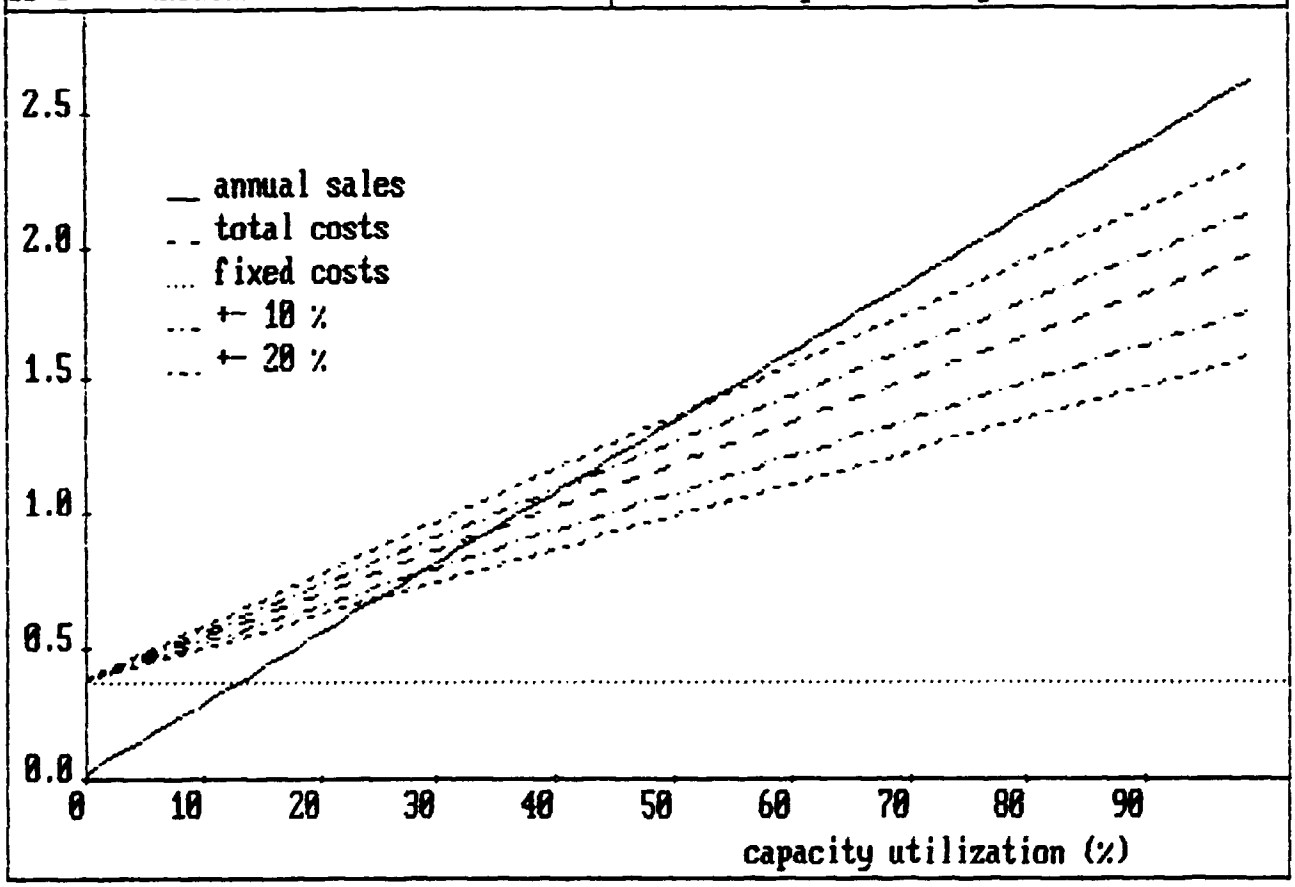


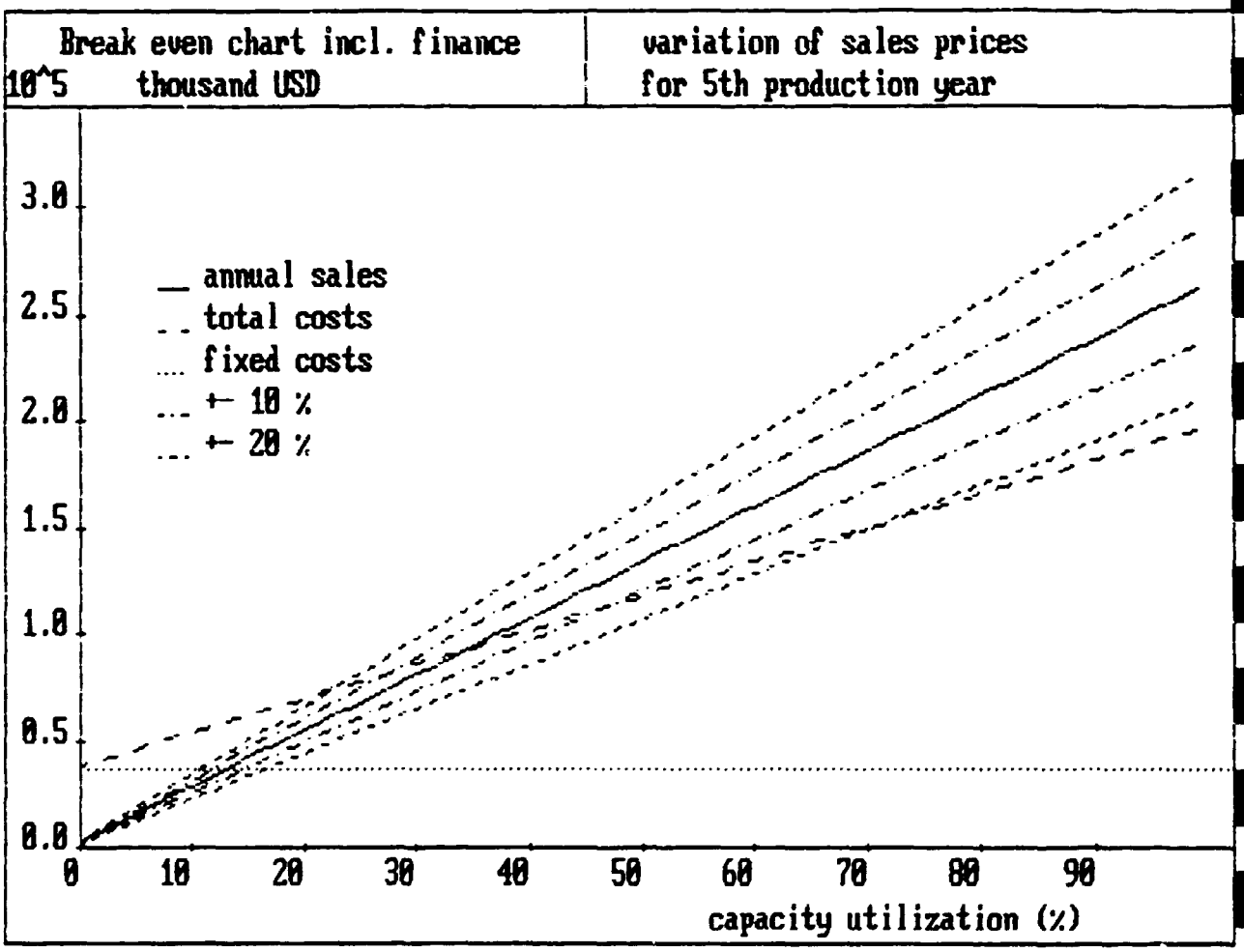

Break Even Chart excl. finance
10^5 thousand USD
for 5th production year
2.5
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)



Break even chart incl. finance
10^5 thousand USD

variation of variable costs
for 5th production year

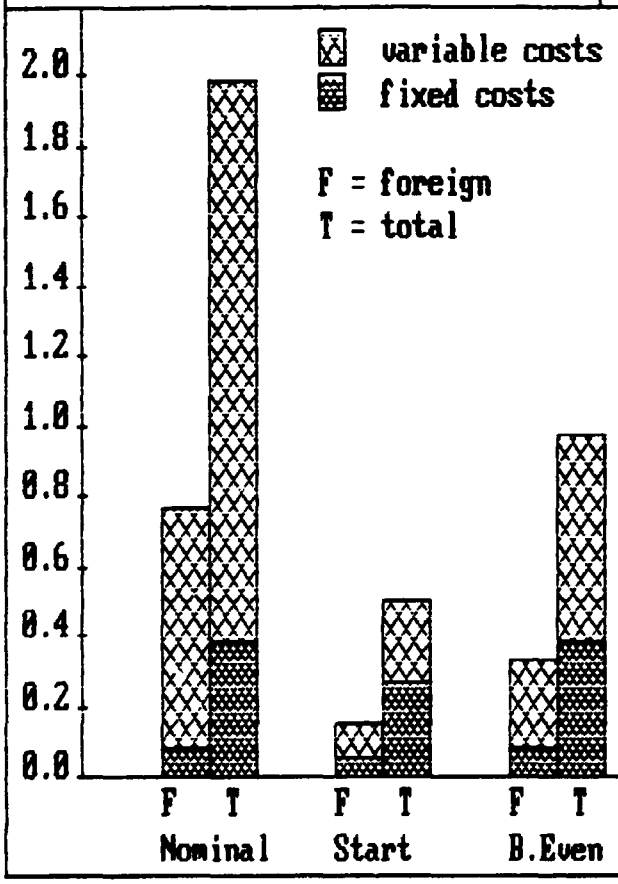




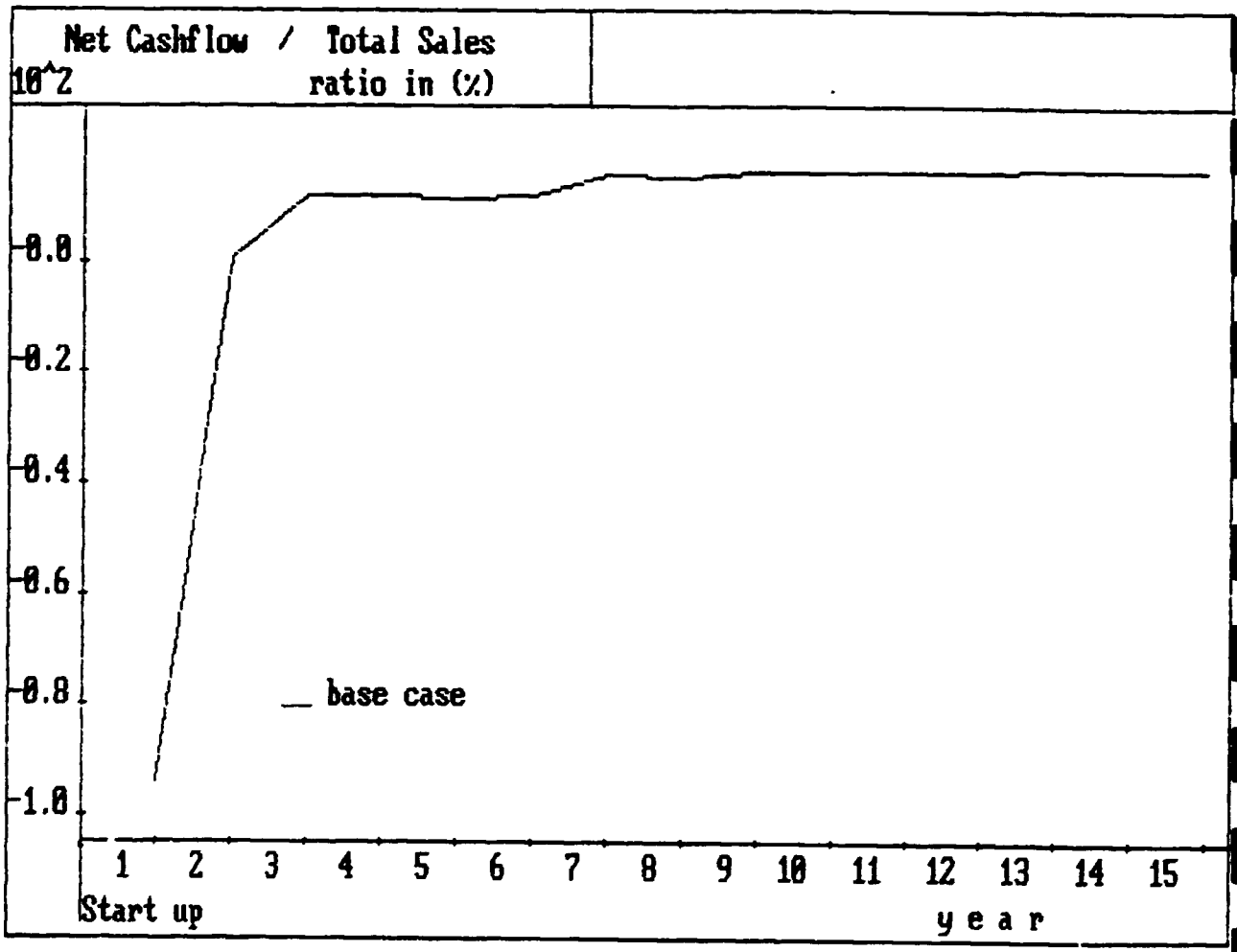
Structure of Production Costs

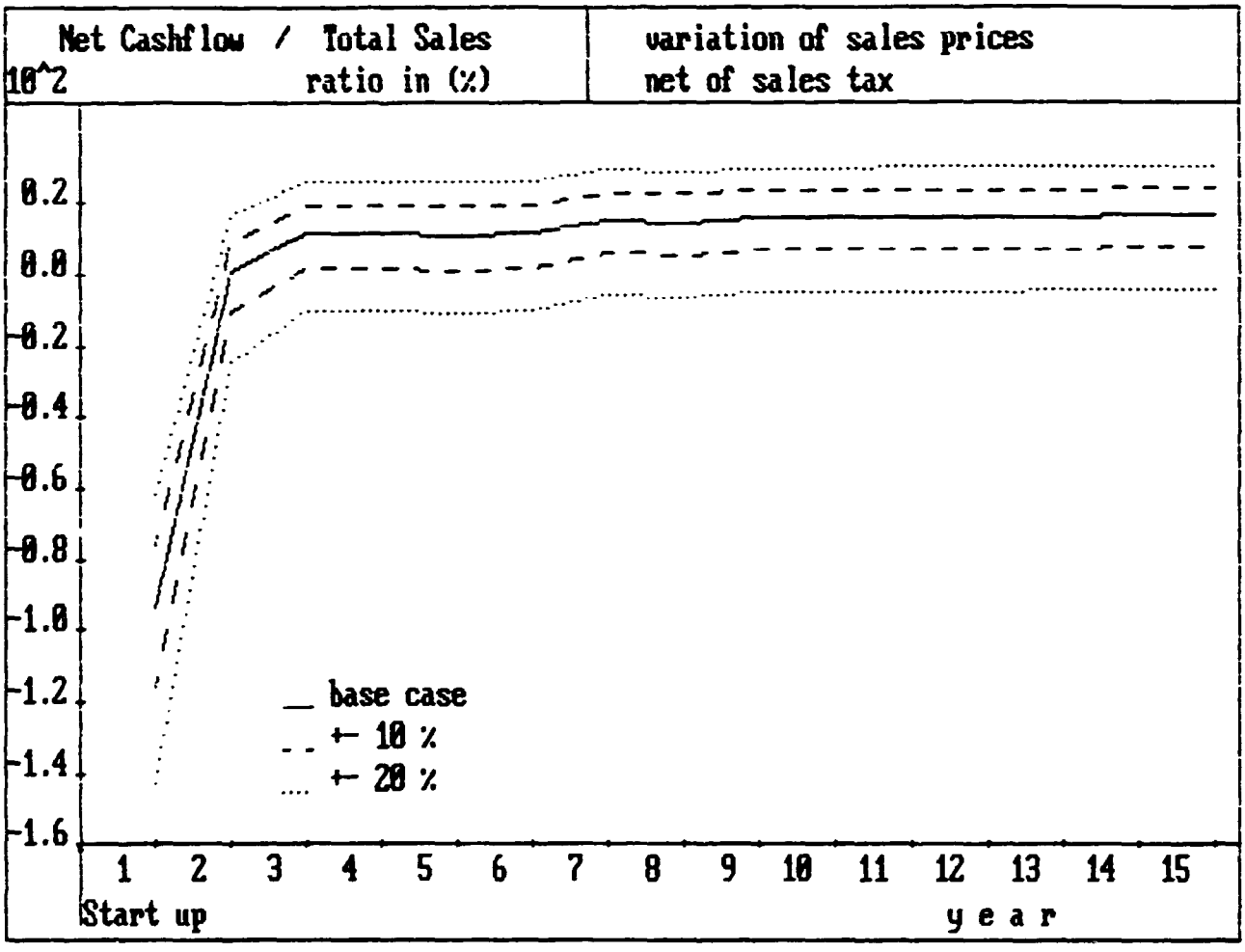
10^5 thousand USD

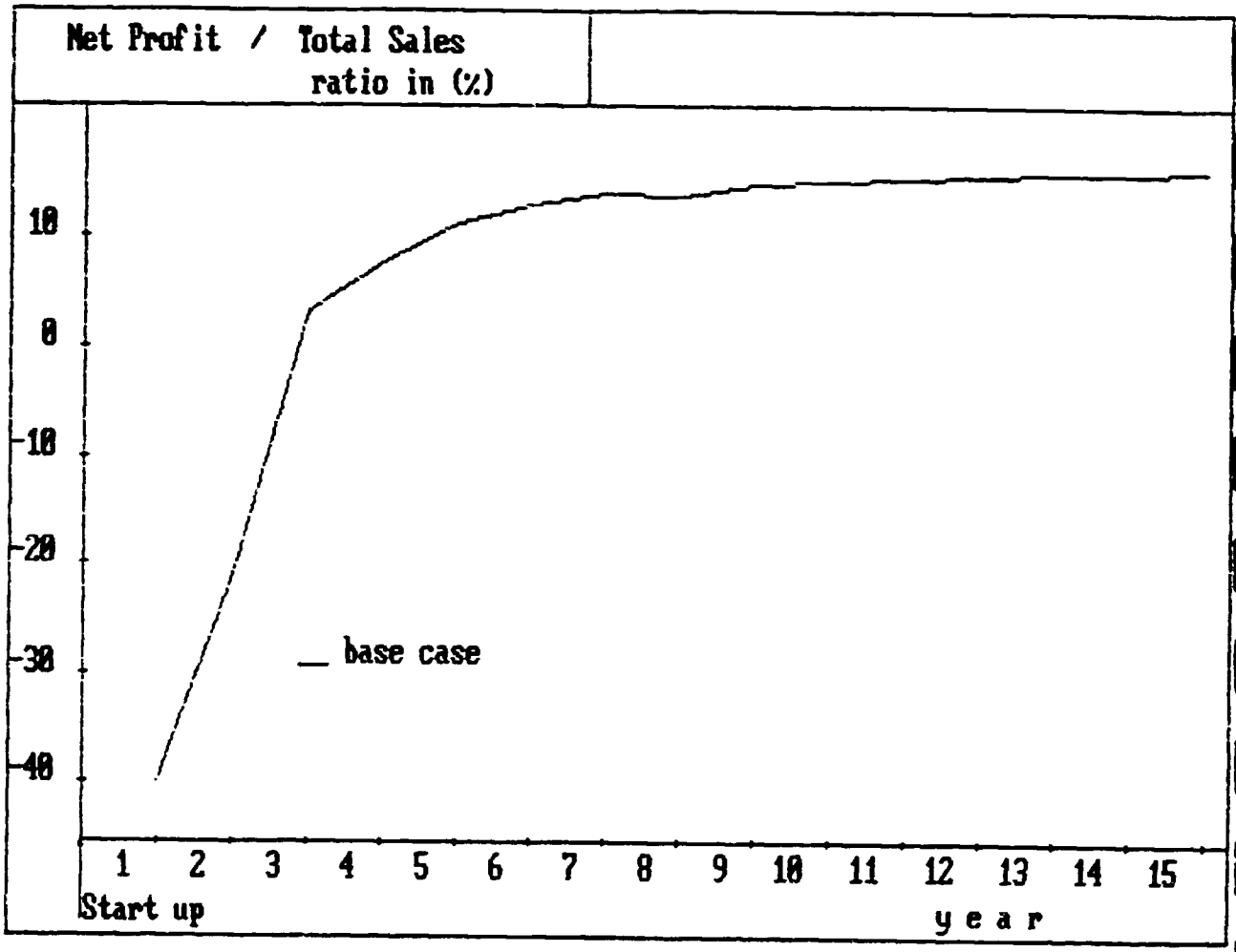
for 5th production year

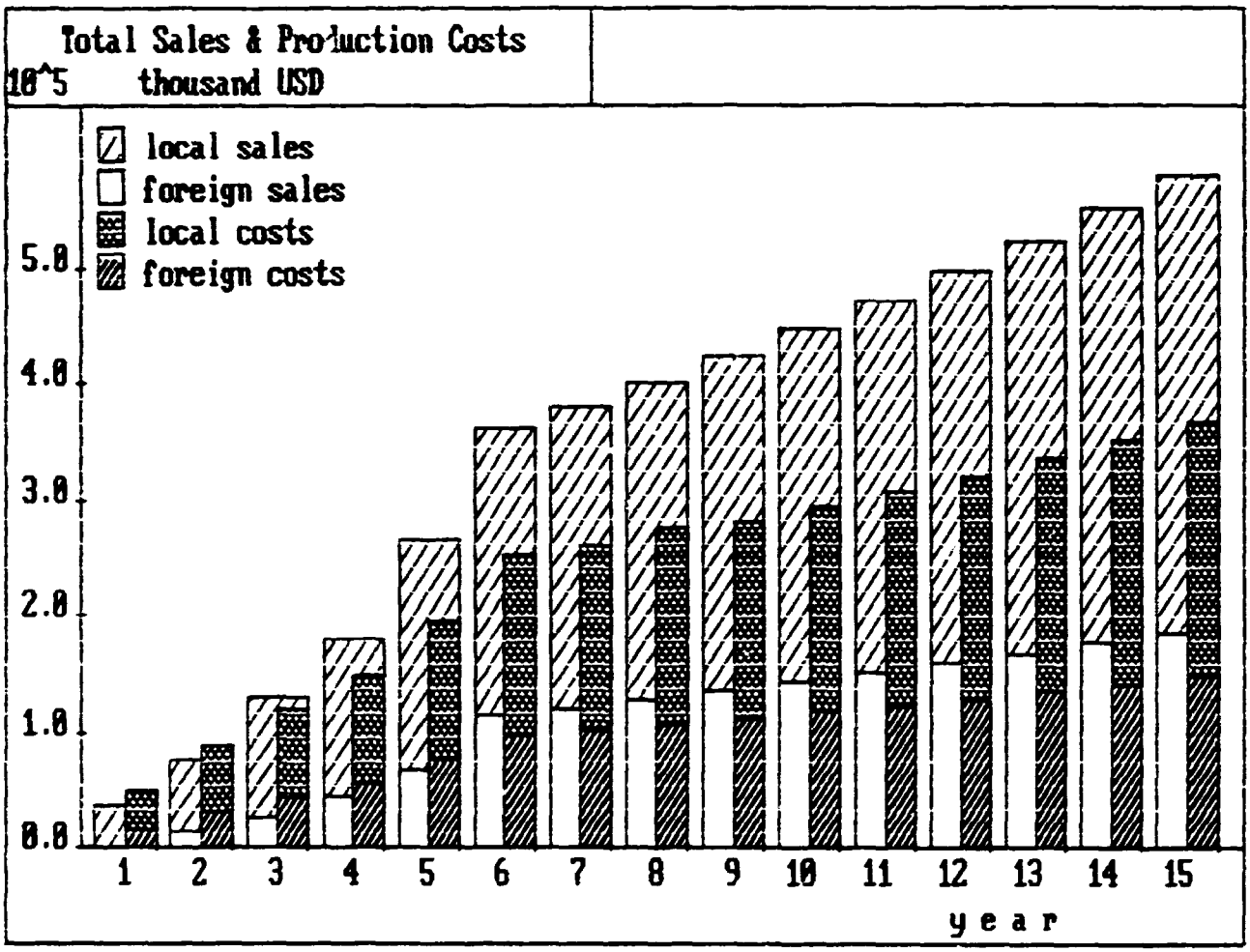


Nominal	Start up	
70.95	39.56	raw material
6.61	4.48	other RM
3.39	6.16	utilities
0.16	0.30	energy
0.89	3.32	labour
1.36	3.87	maintenance
0.55	0.81	spares
9.64	28.73	overheads
3.52	12.77	depreciation
2.93	0.00	interest
100.00	100.00	Total Prod C.


Net Cashflow / Total Sales
ratio in (%)
10^2
0.0
0.2
0.4
0.6
0.8
1.0
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Net Cashflow / Total Sales
ratio in (%)
10^2
variation of sales prices
net of sales tax
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
-1.6
base case
+- 10 %
+- 20 %
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Net Profit / Total Sales
ratio in (%)
10
0
-10
-20
-30
-40
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year



Results of Financial and Economical Analysis

VARIANT 2

1500 Trucks per year

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Production road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	74460.00	42.479 % foreign
current assets:	350.00	100.000 % foreign
total assets:	74810.00	42.748 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	42000.00	
local loans :	38440.00	
total funds :	80440.00	52.213 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	20706.98	75747.76	94384.59
depreciation :	4082.06	4195.14	4195.14
interest :	5381.60	3845.80	0.00
production costs	30170.64	83788.70	98579.73
thereof foreign	26.69 %	37.67 %	38.09 %
total sales :	20080.50	113944.60	145425.30
gross income :	-12520.14	18096.74	34632.00
net income :	-12520.14	8143.53	15584.40
cash balance :	-18402.26	-5664.50	18816.39
net cashflow :	-13020.66	15087.96	18816.39

Net Present Value at: 11.50 % = 4531.70
Internal Rate of Return: 12.22 %
Return on equity: 36.49 %
Return on equi 13.08 %

Index of Schedules produced by COMFAR

Total Initial Investment in thousand USD

Year	1995	1996	1997
Fixed investment costs			
Land, site preparation, development	950.000	420.000	0.000
Buildings and civil works	3950.000	9810.000	12990.000
Auxiliary and service facilities	1780.000	5070.000	6080.000
Incorporated fixed assets	220.000	270.000	340.000
Plant machinery and equipment	2220.000	12030.000	15430.000
Total fixed investment costs	9120.000	27600.000	34840.000
Pre-production capital expenditures	0.000	0.000	2900.000
Net working capital	0.000	0.000	350.000
Total initial investment costs	9120.000	27600.000	38090.000
Of it foreign, in %	24.342	43.587	46.548

Total Current Investment in thousand USD

Year	1998	1999	2000	2001	2002
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	770.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	500.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	740.000	0.000	0.000	0.000	0.000
Total fixed investment costs	2010.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	1580.000	0.000	0.000	0.000	0.000
Working capital	6374.182	5844.984	3444.053	3875.118	1096.516
Total current investment costs	9964.182	5844.984	3444.053	3875.118	1096.516
Of it foreign, %	50.216	41.246	41.349	43.102	41.639

Total Current Investment in thousand USD

Year	2003	2004	2005	2006	2007
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	761.621	1132.336	733.567	445.911	963.151
Total current investment costs	761.621	1132.336	733.567	445.911	963.151
Of it foreign, %	1.164	86.518	-30.637	91.051	44.262

Total Current Investment in thousand USD

Year	2008	2009	2010	2011	2012
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures	0.000	0.000	0.000	0.000	0.000
Working capital	1011.312	1061.875	1114.970	1170.716	1229.258
Total current investment costs	1011.312	1061.875	1114.970	1170.716	1229.258
Of it foreign, %	44.262	44.262	44.262	44.262	44.262

Total Production Costs in thousand USD

Year	1998	1999	2000	2001	2002
% of nom. capacity (single product).	22.000	60.000	80.000	100.000	100.000
Raw material 1	10269.600	29408.400	41171.750	54037.930	56739.820
Other raw materials	1258.400	3432.000	4576.000	5720.000	5720.000
Utilities	1159.760	1739.640	2115.036	2523.622	2649.803
Energy	55.860	83.790	101.871	121.551	127.628
Labour, direct	1269.400	999.600	679.140	891.371	935.940
Repair, maintenance	708.960	811.440	889.056	972.405	1021.025
Spares	225.000	234.000	243.450	253.372	810.769
Factory overheads	3600.000	3780.000	3969.000	4167.449	4375.822
Factory costs	18546.980	40488.870	53745.300	68687.700	72380.810
Administrative overheads	1660.000	1743.000	1830.150	1921.657	2017.740
Indir. costs, sales and distribution	500.000	525.000	551.250	578.812	607.753
Direct costs, sales and distribution	180.000	777.000	1036.352	1238.656	1300.594
Depreciation	4082.060	4195.140	4195.140	4195.140	4195.140
Financial costs	5381.600	10001.600	7949.667	5897.733	3845.300
Total production costs	30350.640	57730.610	69307.860	82519.700	84347.840
Costs per unit (single product)	91.972	64.145	57.757	55.013	56.232
Of it foreign, %	27.122	38.153	37.779	38.026	38.083
Of it variable,%	40.249	60.687	70.301	76.952	78.646
Total labour	1659.400	1409.100	1109.115	1342.845	1409.987

Total Production Costs in thousand USD

Year	2003	2004	2005	2006	2007
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	59576.810	62555.650	65683.440	68967.590	72415.980
Other raw materials	5720.000	5720.000	5720.000	5720.000	5720.000
Utilities	2782.293	2921.408	3067.478	3220.852	3381.894
Energy	134.010	140.710	147.746	155.133	162.889
Labour, direct	982.737	1031.874	1083.467	1137.640	1194.522
Repair, maintenance	3560.825	1125.680	4952.992	1241.062	1303.115
Spares	274.731	1264.487	298.278	310.942	324.239
Factory overheads	4594.613	4824.343	5065.560	5318.838	5584.780
Factory costs	77626.020	79584.150	86018.950	86072.060	90087.420
Administrative overheads	2118.627	2224.558	2335.786	2452.575	2575.204
Indir. costs, sales and distribution	638.141	670.048	703.550	738.728	775.664
Direct costs, sales and distribution	1365.617	1433.906	1505.594	1580.883	1659.922
Depreciation	4195.140	4195.140	4195.140	4195.140	4195.140
Financial costs	1793.867	0.000	0.000	0.000	0.000
Total production costs	87737.410	88107.800	94759.020	95039.390	99293.350
Costs per unit (single product)	58.492	58.739	63.173	63.360	66.196
Of it foreign, %	36.289	38.938	36.824	38.444	38.534
Of it variable,%	79.001	82.217	79.911	83.301	83.377
Total labour	1480.486	1554.511	1632.236	1713.848	1799.540

Total Production Costs in thousand USD

Year	2008	2009	2010	2011	2012
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	76036.770	79838.610	83830.530	88022.050	92423.160
Other raw materials	5720.000	5720.000	5720.000	5720.000	5720.000
Utilities	3550.989	3728.538	3914.965	4110.713	4316.248
Energy	171.034	179.586	188.565	197.993	207.893
Labour, direct	1254.248	1316.961	1382.809	1451.949	1524.546
Repair, maintenance	1368.271	1436.684	1508.519	1583.944	1663.141
Spares	338.201	352.861	368.254	384.417	401.387
Factory overheads	5864.018	6157.219	6465.090	6788.333	7127.750
Factory costs	94303.530	98730.450	103378.700	108259.400	113384.100
Administrative overheads	2703.964	2839.162	2981.120	3130.176	3286.685
Indir. costs, sales and distribution	814.447	855.169	897.928	942.824	989.965
Direct costs, sales and distribution	1742.922	1830.063	1921.563	2017.641	2118.531
Depreciation	4195.140	4195.140	4195.140	4195.140	4046.734
Financial costs	0.000	0.000	0.000	0.000	0.000
Total production costs	103760.000	108450.000	113374.500	118545.200	123826.000
Costs per unit (single product)	69.173	72.300	75.583	79.030	82.551
Of it foreign, %	38.621	38.704	38.784	38.861	38.362
Of it variable,%	83.456	83.520	83.588	83.653	83.815
Total labour	1889.517	1983.993	2083.192	2187.352	2296.719

COMFA 2.1 UNID

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year	adc	coto	1998	1999	2000	2001	2002
Current assets &							
Accounts receivable	30	12.0	1928.082	4206.989	5488.587	6993.902	7317.241
Inventory and materials	57	6.3	4314.555	7868.233	10020.500	12356.660	12807.330
Energy	1	360.0	0.155	0.283	0.283	0.338	0.355
Spares	170	2.1	101.250	105.750	110.475	115.436	394.134
Work in progress	15	24.0	772.791	1687.036	2229.388	2861.987	3015.867
Finished products	15	24.0	841.958	1759.661	2315.644	2942.056	3099.939
Cash in hand	15	24.0	310.373	315.335	317.116	341.927	381.721
Total current assets			8269.764	15943.240	20492.000	25612.310	27016.590
Current liabilities and							
Accounts payable	30	12.0	1545.582	3374.073	4478.775	5723.975	6031.734
Net working capital			6724.182	12569.160	16013.220	19888.340	20984.850
Increase in working capital			6374.182	5844.982	3444.057	3875.117	1096.516
Net working capital, local			3240.532	6674.711	8694.680	10899.540	11320.180
Net working capital, foreign			3483.650	5894.455	7318.540	8988.793	9664.677

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year	adc	coto	2003	2004	2005	2006	2007
Current assets &							
Accounts receivable	30	12.0	7770.701	7951.055	9505.324	8523.688	8883.184
Inventory and materials	57	6.3	13280.530	13777.390	14299.090	14846.880	15422.060
Energy	1	360.0	0.372	0.391	0.410	0.431	0.452
Spares	170	2.1	126.115	620.993	137.889	144.221	150.969
Work in progress	15	24.0	3234.418	3316.066	3584.123	3586.336	3753.643
Finished products	15	24.0	3322.694	3408.696	3681.447	3688.527	3860.942
Cash in hand	15	24.0	480.481	436.289	572.337	435.877	457.577
Total current assets			28215.310	29510.820	30780.620	31230.960	32529.730
Current liabilities and							
Accounts payable	30	12.0	6468.935	6632.013	7168.246	7172.672	7507.285
Net working capital			21746.470	22878.810	23612.380	24058.290	25021.440
Increase in working capital			761.621	1132.334	733.568	445.910	963.154
Net working capital, local			12072.930	12225.590	13183.900	13223.810	13760.650
Net working capital, foreign			9673.539	10653.220	10428.470	10834.480	11260.790

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

Net Working Capital in thousand USD

Year	mdc	coto	2008	2009	2010	2011	2012
Coverage							
Current assets :							
Accounts receivable	30	12.0	9255.404	9646.237	10056.610	10487.500	10939.940
Inventory and materials	57	6.3	16025.990	16660.130	17325.960	18025.090	18759.180
Energy	1	360.0	0.475	0.499	0.524	0.550	0.577
Spares	170	2.1	157.850	165.180	172.877	180.958	189.444
Work in progress	15	24.0	3929.314	4113.769	4307.447	4510.809	4724.338
Finished products	15	24.0	4041.979	4232.067	4431.660	4641.232	4861.284
Cash in hand	15	24.0	480.362	504.287	529.408	555.784	583.480
Total current assets			33891.380	35322.160	36824.480	38401.930	40058.250
Current liabilities and							
Accounts payable	30	12.0	7858.627	8227.538	8614.894	9021.617	9448.677
Net working capital			26032.750	27094.620	28209.590	29380.320	30609.570
Increase in working capital			1011.311	1061.869	1114.969	1170.727	1229.258
Net working capital, local			14324.340	14916.210	15537.680	16190.220	16875.390
Net working capital, foreign			11708.410	12178.410	12671.920	13190.090	13734.180

Note: mdc = minimum days of coverage ; coto = coefficient of turnover .

Source of Finance, construction in thousand USD

Year	1995
Equity, ordinary ..	0.000
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	42000.000
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	38440.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	80440.000
Current liabilities	0.000
Bank overdraft	0.000
Total funds	80440.000

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Source of Finance, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	-10500.000	-10500.000	-10500.000	-10500.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	-6406.667	-6406.667	-6406.667	-6406.667	-6406.667
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	-16906.670	-16906.670	-16906.670	-16906.670	-6406.667
Current liabilities	1545.582	1828.491	1104.703	1245.199	207.760	437.101
Bank overdraft	12772.270	24623.490	11715.750	10062.120	5664.508	-6208.820
Total funds	14317.850	9545.317	-4086.214	-5599.350	-10934.400	-12178.390

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Source of Finance, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	-6406.668	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-6406.668	0.000	0.000	0.000	0.000	0.000
Current liabilities	163.177	536.233	4.426	334.613	351.343	368.910
Bank overdraft	-8363.383	-15002.290	-18131.660	-17131.980	0.000	0.000
Total funds	-14606.870	-14466.060	-18127.230	-16797.360	351.343	368.910

Source of Finance, production in thousand USD

Year	2010	2011	2012
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	0.000	0.000	0.000
Current liabilities	387.355	406.724	427.060
Bank overdraft	0.000	0.000	0.000
Total funds	387.355	406.724	427.060

Cashflow Tables, construction in thousand USD

Year	1995	1996	1997
Total cash inflow	80440.000	0.000	0.000
Financial resources	80440.000	0.000	0.000
Sales, net of tax	0.000	0.000	0.000
Total cash outflow	9120.000	27600.000	38090.000
Total assets	9120.000	27600.000	38090.000
Operating costs	0.000	0.000	0.000
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	0.000	0.000	0.000
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	71320.000	-27600.000	-38090.000
Cumulated cash balance	71320.000	43720.000	5630.000
Inflow, local	38440.000	0.000	0.000
Outflow, local	6900.000	15570.000	20360.000
Surplus (deficit)	31540.000	-15570.000	-20360.000
Inflow, foreign	42000.000	0.000	0.000
Outflow, foreign	2220.000	12030.000	17730.000
Surplus (deficit)	39780.000	-12030.000	-17730.000
Net cashflow	-9120.000	-27600.000	-38090.000
Cumulated net cashflow	-9120.000	-36720.000	-74810.000

Cashflow tables, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Total cash inflow	19376.000	53492.110	74852.400	98263.840	102752.300	108578.900
Financial resources	1545.582	1828.491	1104.703	1245.199	307.760	437.101
Sales, net of tax	17830.500	51663.620	73747.700	97018.640	102444.600	108141.800
Total cash outflow	37778.340	78115.610	86568.140	108326.000	108416.800	102370.100
Total assets	11509.760	7673.474	4548.757	5120.317	1404.277	1198.723
Operating costs	20886.980	43533.880	57163.050	72426.810	76306.900	81748.420
Cost of finance	5381.600	10001.600	7949.667	5897.733	3845.800	1793.867
Repayment	0.000	16906.670	16906.670	16906.670	16906.670	6406.667
Corporate tax	0.000	0.000	0.000	7974.420	9953.208	11222.410
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	-18402.260	-24623.500	-11715.740	-10062.110	-5664.508	6208.813
Cumulated cash balance	-12772.260	-37395.760	-49111.500	-59173.610	-64838.120	-58629.300
Inflow, local	18855.810	43775.110	58105.790	73933.880	77410.560	81878.490
Outflow, local	26011.230	44494.250	50066.690	66296.160	67001.660	72490.470
Surplus (deficit)	-7155.414	-719.145	8039.098	7637.727	10408.910	9388.023
Inflow, foreign	520.267	9717.009	16746.610	24329.960	25341.770	26700.420
Outflow, foreign	11767.120	33621.360	36501.450	42029.800	41415.200	29879.620
Surplus (deficit)	-11246.850	-23904.360	-19754.850	-17699.840	-16073.430	-3179.207
Net cashflow	-13020.660	2284.764	13140.580	12742.290	15087.960	14409.350
Cumulated net cashflow	-97830.660	-85545.900	-72405.310	-59663.020	-44575.070	-30165.720

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Cashflow tables, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Total cash inflow	114326.300	120941.300	127133.600	134260.000	141547.900	149200.300
Financial resources	202.450	536.233	133.323	334.613	351.343	368.910
Sales, net of tax	114123.900	120405.100	127000.300	133925.300	141196.600	148831.400
Total cash outflow	105963.000	105939.000	109002.000	115443.600	121517.600	127895.300
Total assets	1295.510	1269.802	450.335	1297.766	1362.652	1430.787
Operating costs	83912.670	90563.880	90844.230	95098.210	99564.860	104254.800
Cost of finance	0.000	0.000	0.000	0.000	0.000	0.000
Repayment	6445.940	0.000	128.896	0.000	0.000	0.000
Corporate tax	14308.850	14105.330	17578.520	19047.600	20590.130	22209.790
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	8363.375	15002.300	18131.660	18816.380	20030.300	21304.910
Cumulated cash balance	-50265.930	-35263.630	-17131.970	1684.406	21714.710	43019.620
Inflow, local	85976.520	91156.130	95588.610	100952.700	106390.300	112099.300
Outflow, local	72511.340	73262.520	73964.080	78653.770	82888.350	87334.680
Surplus (deficit)	13465.180	17893.600	21624.530	22298.880	23501.920	24765.110
Inflow, foreign	28349.820	29785.190	31545.040	33307.290	35157.660	37100.540
Outflow, foreign	33451.630	32676.490	35037.900	36789.800	38629.290	40560.740
Surplus (deficit)	-5101.809	-2891.307	-3492.857	-3482.512	-3471.629	-3460.207
Net cashflow	14770.040	15002.300	18131.670	18816.380	20030.290	21304.920
Cumulated net cashflow	-15395.660	-393.381	17738.290	36554.660	56584.960	77889.880

Cashflow tables, production in thousand USD

Year	2010	2011	2012
Total cash inflow	157235.300	165672.100	174530.700
Financial resources	387.355	406.724	427.060
Sales, net of tax	156848.000	165265.400	174103.600
Total cash outflow	134592.100	141623.600	149088.300
Total assets	1502.324	1577.443	1656.314
Operating costs	109179.300	114350.000	119779.300
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	23910.430	25696.100	27652.670
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	22643.250	24048.480	25442.420
Cumulated cash balance	65662.870	89711.350	115153.800
Inflow, local	118094.800	124389.500	130999.000
Outflow, local	92003.300	96905.380	102134.100
Surplus (deficit)	26091.480	27484.130	28864.940
Inflow, foreign	39140.560	41282.580	43531.710
Outflow, foreign	42588.780	44718.220	46954.120
Surplus (deficit)	-3448.219	-3435.637	-3422.414
Net cashflow	22643.240	24048.500	25442.420
Cumulated net cashflow	100533.100	124581.600	150024.000

Cashflow Discounting:

a) Equity paid versus Net Income flow:

Net present value	36616.29	at	11.50 %
Internal Rate of Return (IRRE1) ..	36.49 %		

b) Net Worth versus Net cash return:

Net present value	5936.32	at	11.50 %
Internal Rate of Return (IRRE2) ..	13.08 %		

c) Internal Rate of Return on total Investment:

Net present value	4531.70	at	11.50 %
Internal Rate of Return (IRR) ..	12.22 %		

Net Worth = Equity paid plus reserves

Net Income Statement in thousand USD

Year	1998	1999	2000	2001	2002
Total sales, incl. sales tax	20080.500	58613.620	82447.700	108518.600	113944.600
Less: variable costs, incl. sales tax.	14465.980	42022.070	57520.640	75169.530	78067.020
Variable margin	5614.520	16591.550	24927.050	33349.110	35877.560
As % of total sales	27.960	28.307	30.234	30.731	31.487
Non-variable costs, incl. depreciation	12753.060	12656.940	12537.560	12952.430	13935.020
Operational margin	-7138.541	3934.611	12389.490	20396.680	21942.550
As % of total sales	-35.550	6.713	15.027	18.796	19.257
Cost of finance	5381.600	10001.600	7949.667	5897.733	3845.800
Gross profit	-12520.140	-6066.988	4439.828	14498.950	18096.740
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	-12520.140	-6066.988	4439.828	14498.950	18096.740
Tax	0.000	0.000	0.000	7974.420	9953.208
Net profit	-12520.140	-6066.988	4439.828	6524.525	8143.534
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	-12520.140	-6066.988	4439.828	6524.525	8143.534
Accumulated undistributed profit	-12520.140	-18587.130	-14147.300	-7622.775	520.759
Gross profit, % of total sales	-62.350	-10.351	5.385	13.361	15.882
Net profit, % of total sales	-62.350	-10.351	5.385	6.012	7.147
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	-8.421	4.342	13.171	12.684	12.106

COMFAR 2.1 UNIDO

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Net Income Statement in thousand USD

Year	2003	2004	2005	2006	2007
Total sales, incl. sales tax	119641.800	125623.900	131905.100	138500.300	145425.300
Less: variable costs, incl. sales tax.	81109.370	84303.840	87658.020	91179.920	94877.910
Variable margin	38532.440	41320.050	44247.050	47320.410	50547.430
As % of total sales	32.207	32.892	33.545	34.166	34.758
Non-variable costs, incl. depreciation	16334.190	15303.970	18600.990	15359.470	15915.430
Operational margin	22198.250	26016.090	25646.060	31960.940	34632.000
As % of total sales	18.554	20.710	19.443	23.076	23.814
Cost of finance	1793.867	0.000	0.000	0.000	0.000
Gross profit	20404.380	26016.090	25646.060	31960.940	34632.000
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	20404.380	26016.090	25646.060	31960.940	34632.000
Tax	11222.410	14308.850	14105.330	17578.520	19047.600
Net profit	9181.973	11707.240	11540.730	14382.420	15584.400
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	9181.973	11707.240	11540.730	14382.420	15584.400
Accumulated undistributed profit	9702.731	21409.970	32950.700	47333.120	62917.520
Gross profit, % of total sales	17.055	20.710	19.443	23.076	23.814
Net profit, % of total sales	7.675	9.319	8.749	10.384	10.716
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	10.998	11.600	11.352	14.085	15.120

COMFAR 2.1 UNI

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA --

Net Income Statement in thousand USD

Year	2008	2009	2010	2011	2012
Total sales, incl. sales tax	152696.600	160331.400	168348.000	176765.400	185603.600
Less: variable costs, incl. sales tax.	98760.800	102837.800	107118.700	111613.700	116333.300
Variable margin	53935.790	57493.590	61229.250	65151.700	69270.280
As % of total sales	35.322	35.859	36.371	36.858	37.322
Non-variable costs, incl. depreciation	16499.200	17112.150	17755.750	18431.520	18992.700
Operational margin	37436.590	40381.440	43473.500	46720.180	50277.590
As % of total sales	24.517	25.186	25.824	26.431	27.089
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	37436.590	40381.440	43473.500	46720.180	50277.590
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	37436.590	40381.440	43473.500	46720.180	50277.590
Tax	20590.130	22209.790	23910.430	25696.100	27652.670
Net profit	16846.470	18171.650	19563.070	21024.080	22624.910
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	16846.470	18171.650	19563.070	21024.080	22624.910
Accumulated undistributed profit	79763.980	97935.630	117498.700	138522.800	161147.700
Gross profit, % of total sales	24.517	25.186	25.824	26.431	27.089
Net profit, % of total sales	11.033	11.334	11.621	11.894	12.190
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	16.186	17.283	18.411	19.570	20.822

Prodaction road vehicles AKAKI Ethiopia --- June

COMFAR 2.1 UNID

Projected Balance Sheets, construction in thousand USD

Year	1995	1996	1997
Total assets	80440.000	80440.000	80440.000
Fixed assets, net of depreciation	0.000	9120.000	36720.000
Construction in progress	9120.000	27600.000	37740.000
Current assets	0.000	0.000	350.000
Cash, bank	0.000	0.000	0.000
Cash surplus, finance available	71320.000	43720.000	5630.000
Loss carried forward	0.000	0.000	0.000
Loss	0.000	0.000	0.000
Total liabilities	80440.000	80440.000	80440.000
Equity capital	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000
Profit	0.000	0.000	0.000
Long and medium term debt	80440.000	80440.000	80440.000
Current liabilities	0.000	0.000	0.000
Bank overdraft, finance required.	0.000	0.000	0.000
Total debt	80440.000	80440.000	80440.000
Equity, % of liabilities	0.000	0.000	0.000

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COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

Year	1998	1999	2000	2001	2002
Total assets	94757.840	104303.200	104656.800	101142.100	91826.730
Fixed assets, net of depreciation	70377.940	69772.800	65577.660	61382.520	57187.380
Construction in progress	3590.000	0.000	0.000	0.000	0.000
Current assets	7958.791	15627.600	20174.880	25270.380	26634.870
Cash, bank	310.973	315.335	317.116	341.927	381.721
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	0.000	12520.140	18587.130	14147.300	7622.775
Loss	12520.140	6066.988	0.000	0.000	0.000
Total liabilities	94757.840	104303.200	104656.800	101142.100	91826.730
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000	0.000	0.000
Profit	0.000	0.000	4439.828	6524.525	8143.534
Long and medium term debt	80440.000	63533.340	46626.670	29720.000	12813.340
Current liabilities	1545.582	3374.073	4478.775	5723.975	6031.734
Bank overdraft, finance required.	12772.270	37395.770	49111.510	59173.630	64838.130
Total debt	94757.840	104303.200	100217.000	94617.600	83683.200
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

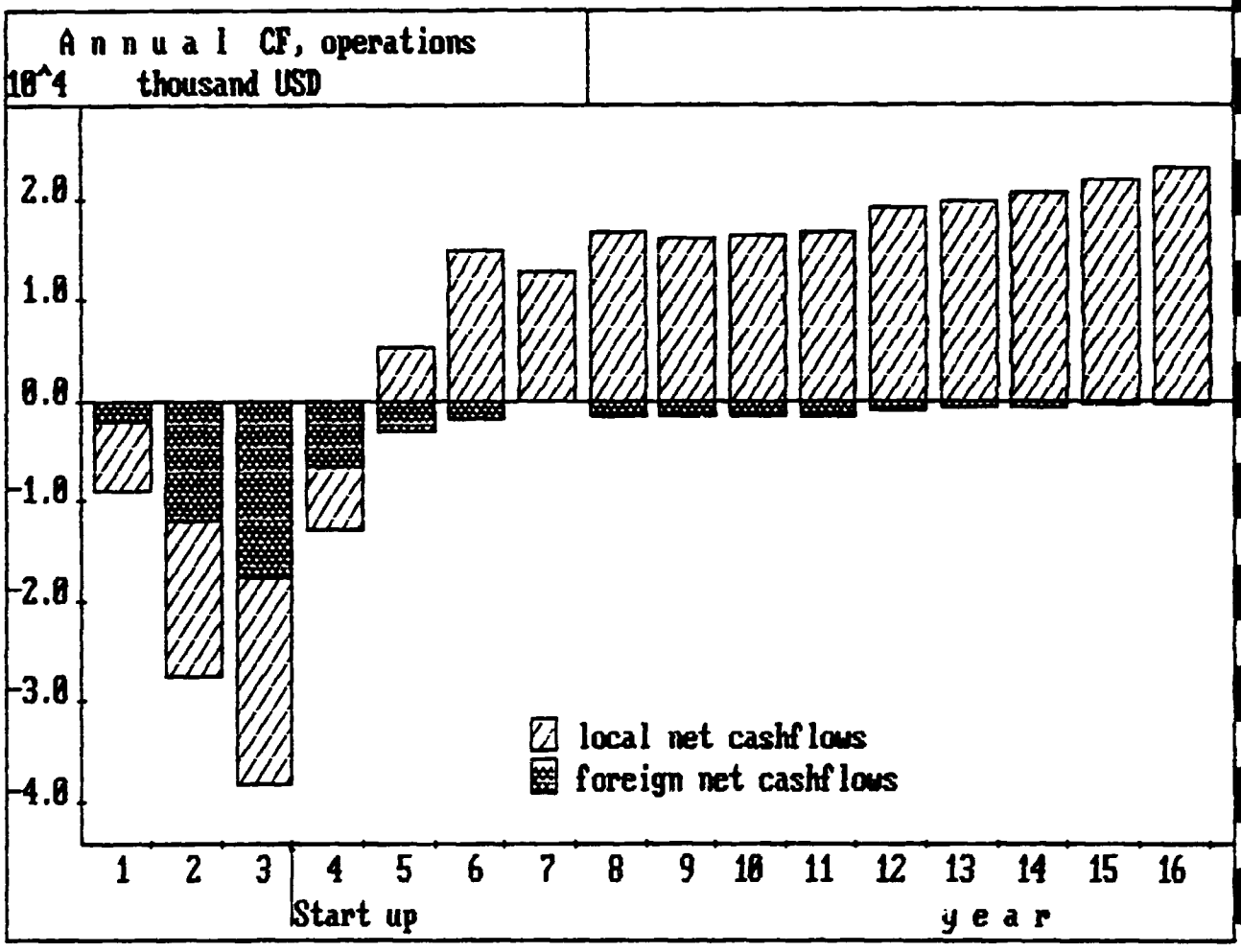
COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

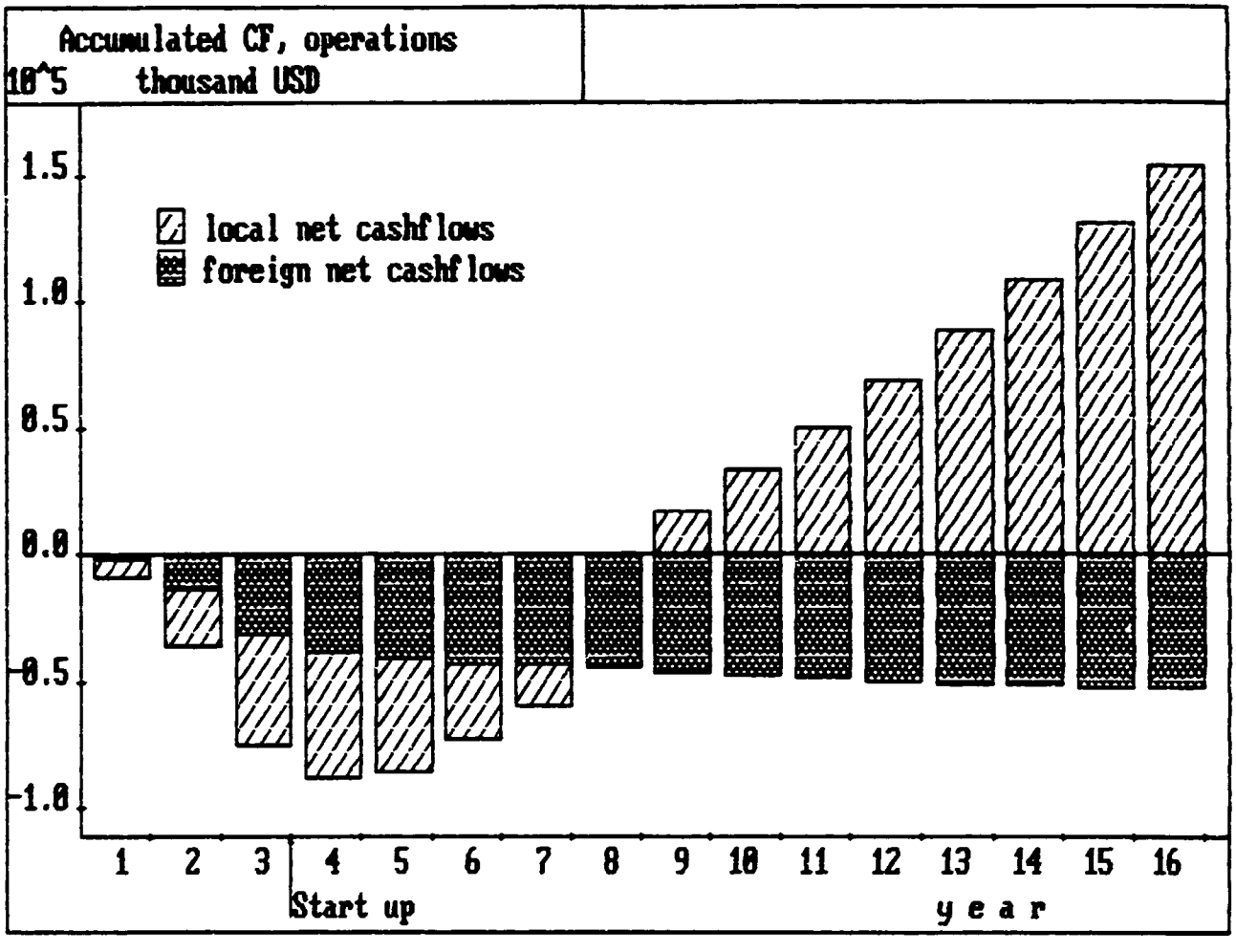
Projected Balance Sheets, Production in thousand USD

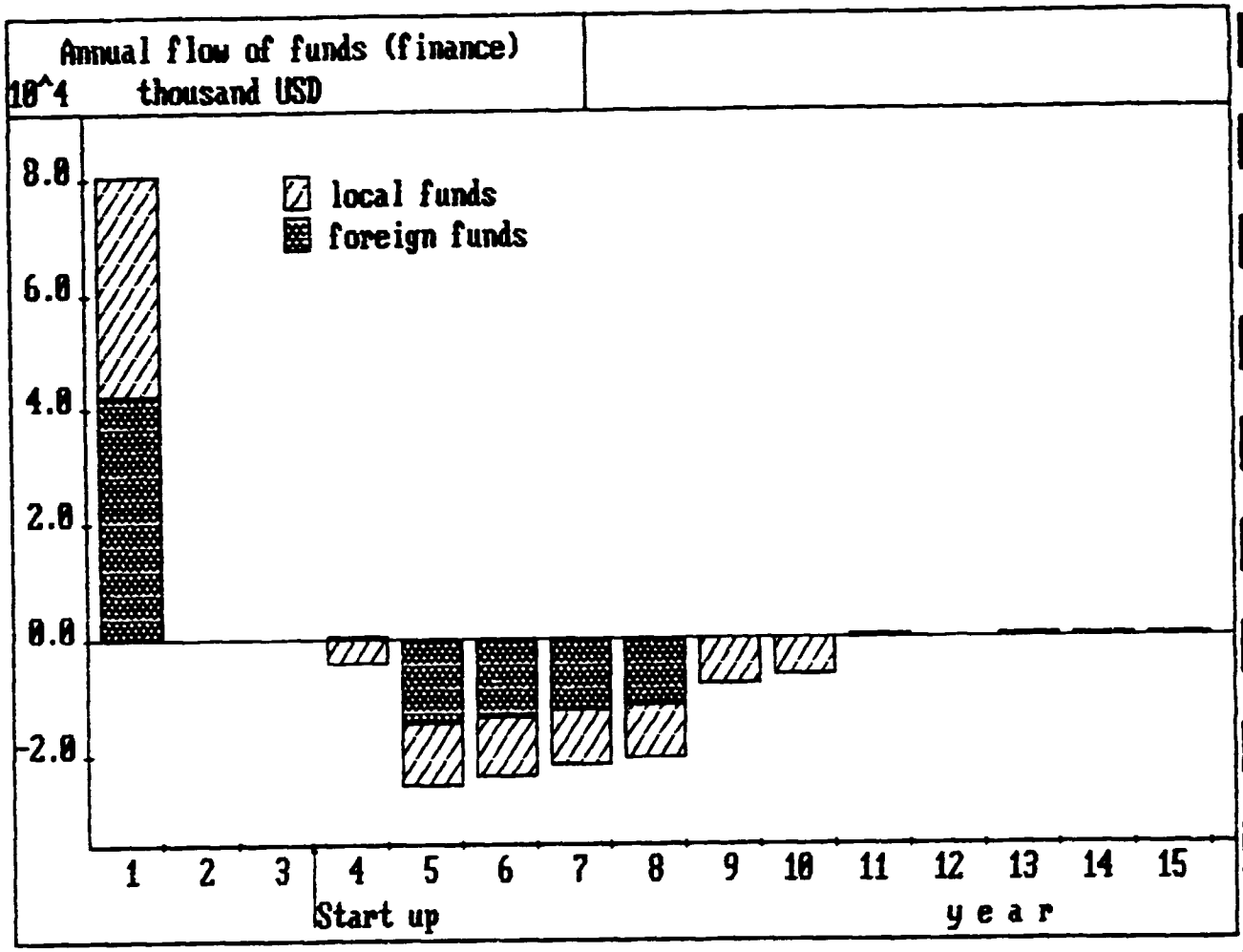
Year	2003	2004	2005	2006	2007
Total assets	81207.550	78307.910	75382.580	71637.770	70424.800
Fixed assets, net of depreciation	52992.230	48797.090	44601.950	40406.810	36211.670
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	27734.830	29074.530	30208.290	30795.080	32071.150
Cash, bank	480.481	436.289	572.337	435.877	457.577
Cash surplus, finance available	0.000	0.000	0.000	0.000	1684.406
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	81207.550	78307.910	75382.580	71637.770	70424.800
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	520.759	9702.731	21409.970	32950.700	47333.120
Profit	9181.973	11707.240	11540.730	14382.420	15584.400
Long and medium term debt	6406.669	0.001	0.001	0.001	0.001
Current liabilities	6463.836	6632.013	7168.247	7172.673	7507.286
Bank overdraft, finance required.	58629.310	50265.930	35263.640	17131.980	0.000
Total debt	71504.820	56897.950	42431.880	24304.650	7507.287
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

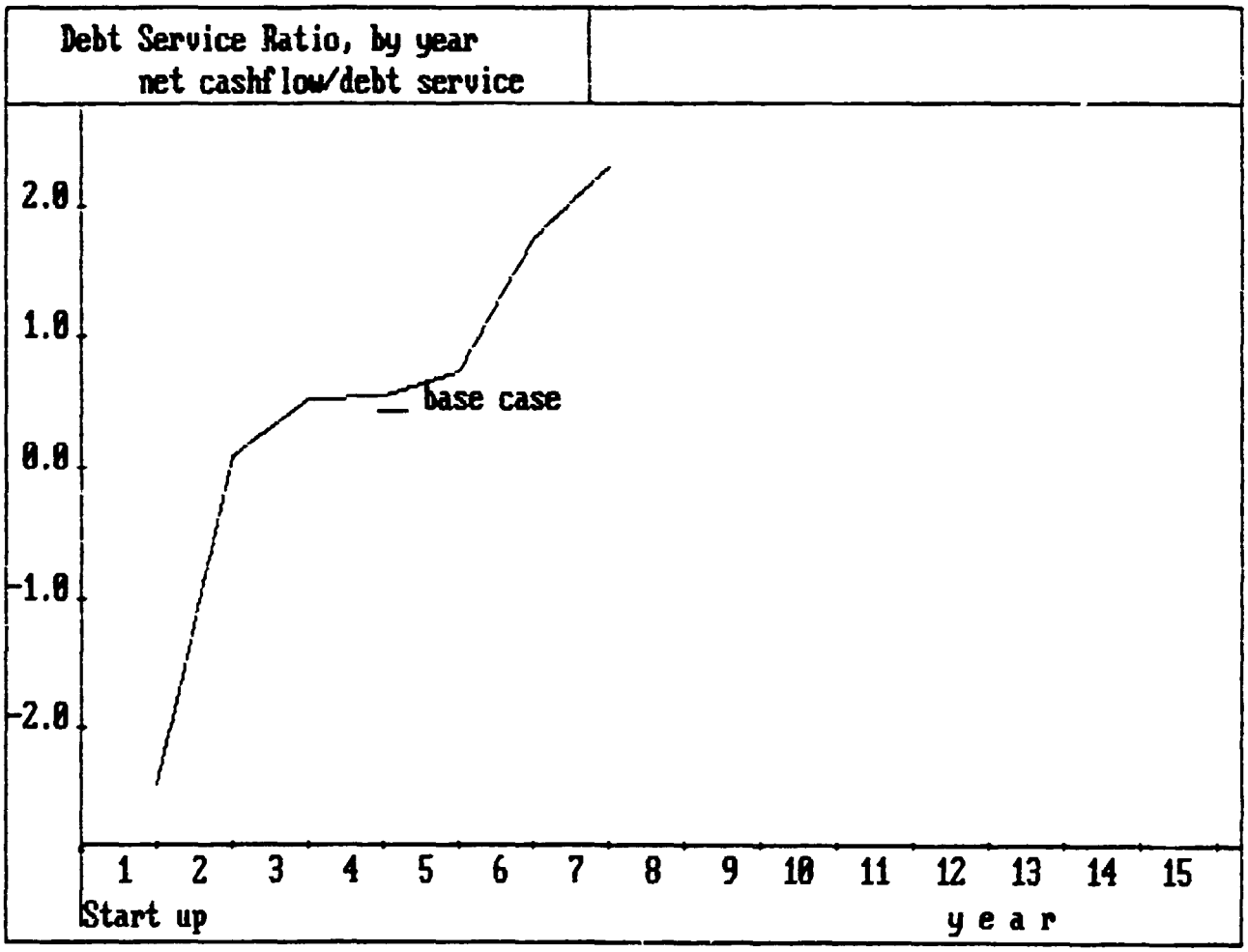
Projected Balance Sheets, Production in thousand USD

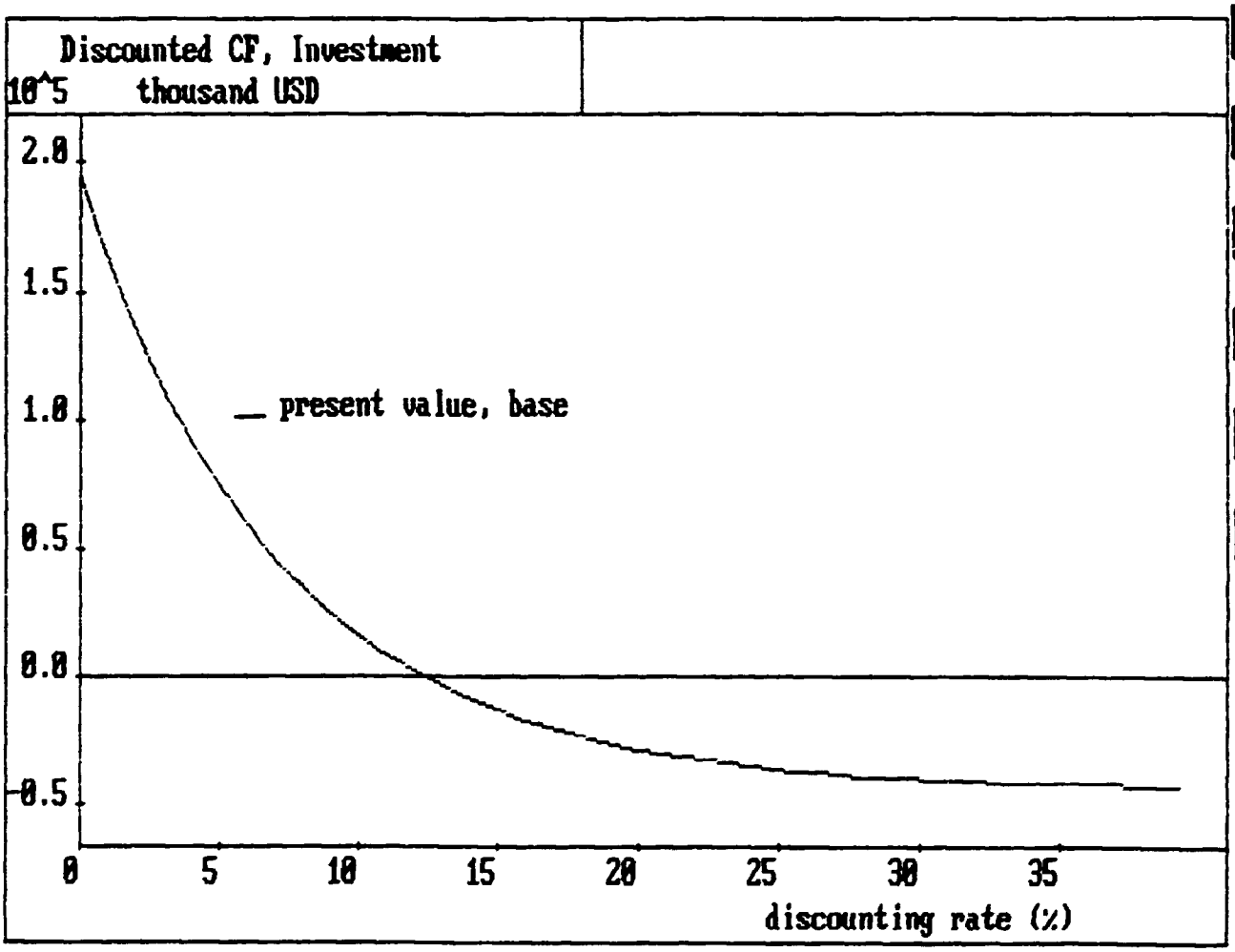
Year	2008	2009	2010	2011	2012
Total assets	87622.610	106163.200	126113.600	147544.400	170596.400
Fixed assets, net of depreciation	32016.530	27821.390	23626.250	19431.110	15384.380
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	33411.020	34817.880	36295.080	37846.150	39474.770
Cash, bank	480.362	504.287	529.408	555.784	583.480
Cash surplus, finance available	21714.700	43019.620	65662.860	89711.360	115153.700
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	87622.610	106163.200	126113.600	147544.400	170596.400
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	62917.520	79763.980	97935.630	117498.700	138522.800
Profit	16846.470	18171.650	19563.070	21024.080	22624.910
Long and medium term debt	0.001	0.001	0.001	0.001	0.001
Current liabilities	7858.628	8227.538	8614.894	9021.617	9448.677
Bank overdraft, finance required	0.000	0.000	0.000	0.000	0.000
Total debt	7858.629	8227.539	8614.895	9021.619	9448.678
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000


A n n u a l CF, operations
10^4 thousand USD
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
y e a r

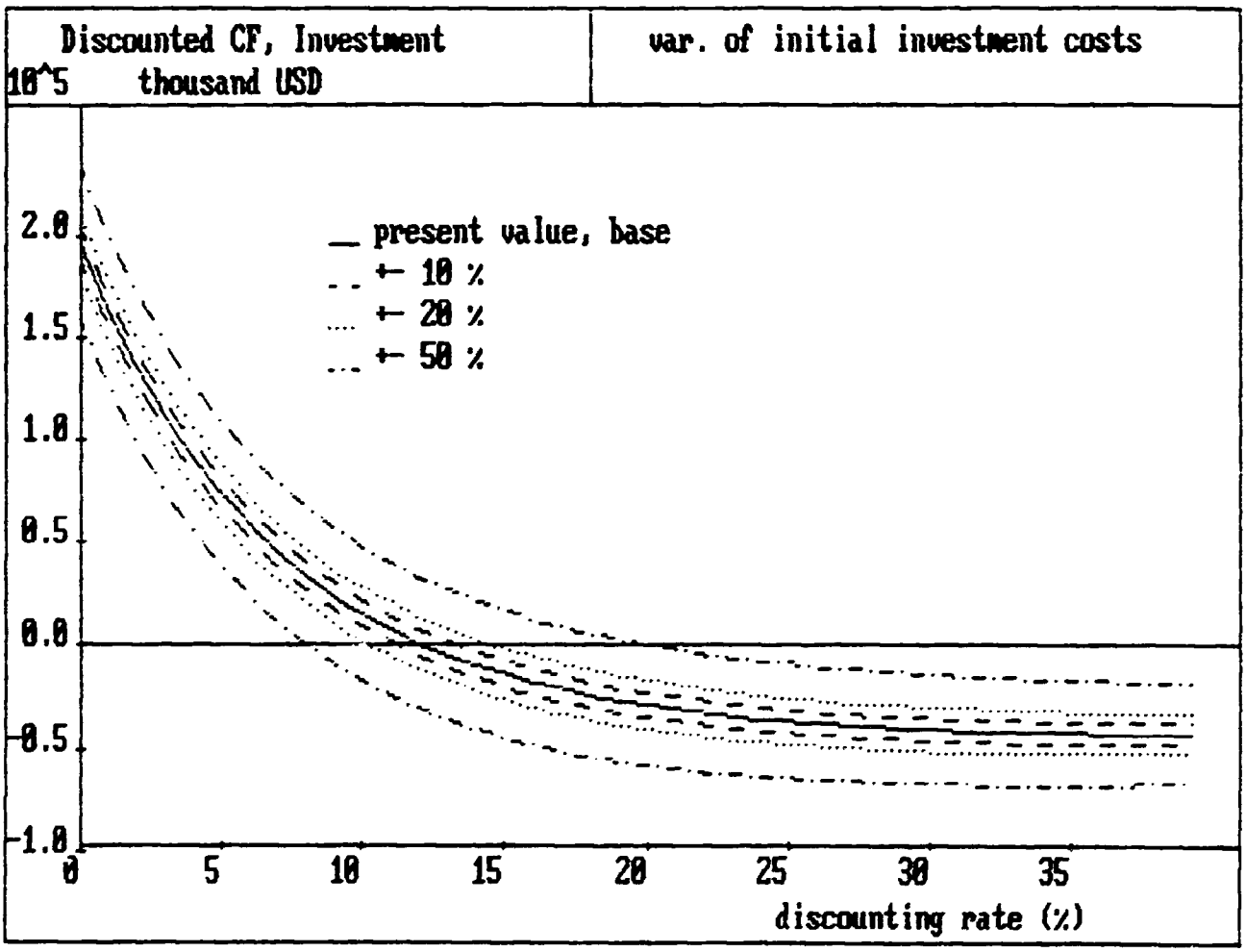

Accumulated CF, operations
10^5 thousand USD
1.5
1.0
0.5
0.0
-0.5
-1.0
local net cashflows
foreign net cashflows
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year

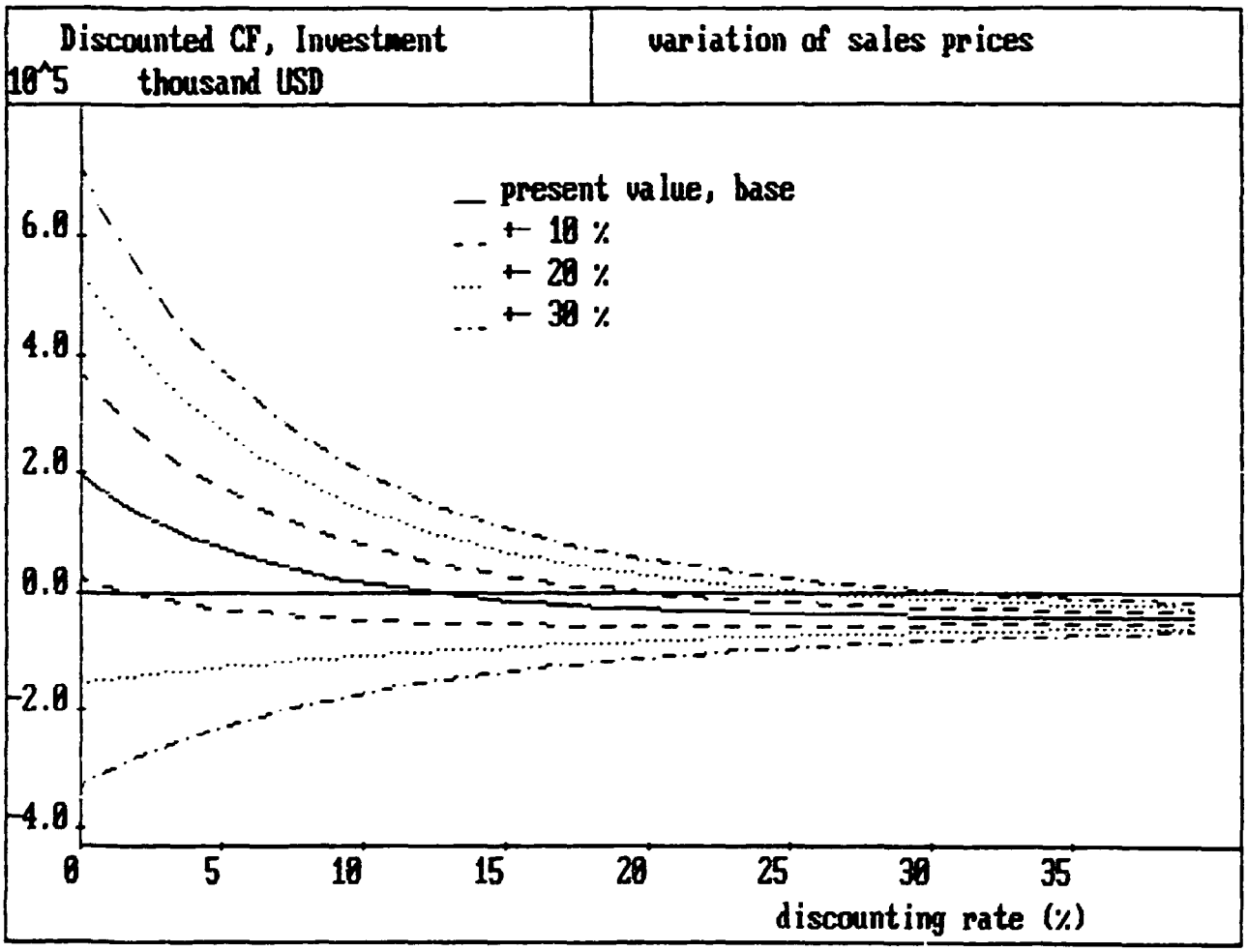

Annual flow of funds (finance)
10^4 thousand USD
8.0
6.0
4.0
2.0
0.0
-2.0
local funds
foreign funds
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

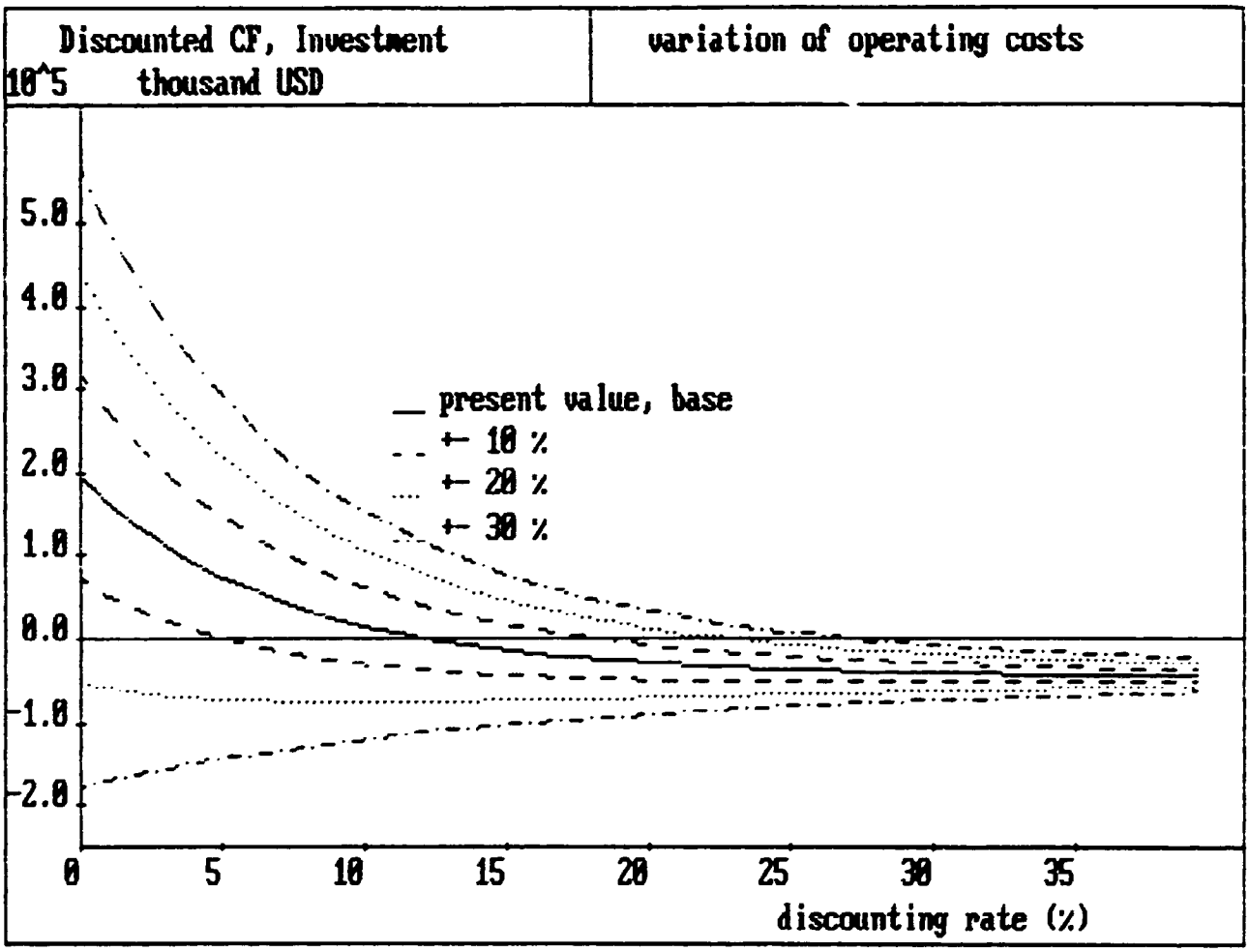

Debt Service Ratio, by year
net cashflow/debt service
2.0
1.0
0.0
-1.0
-2.0
base case
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

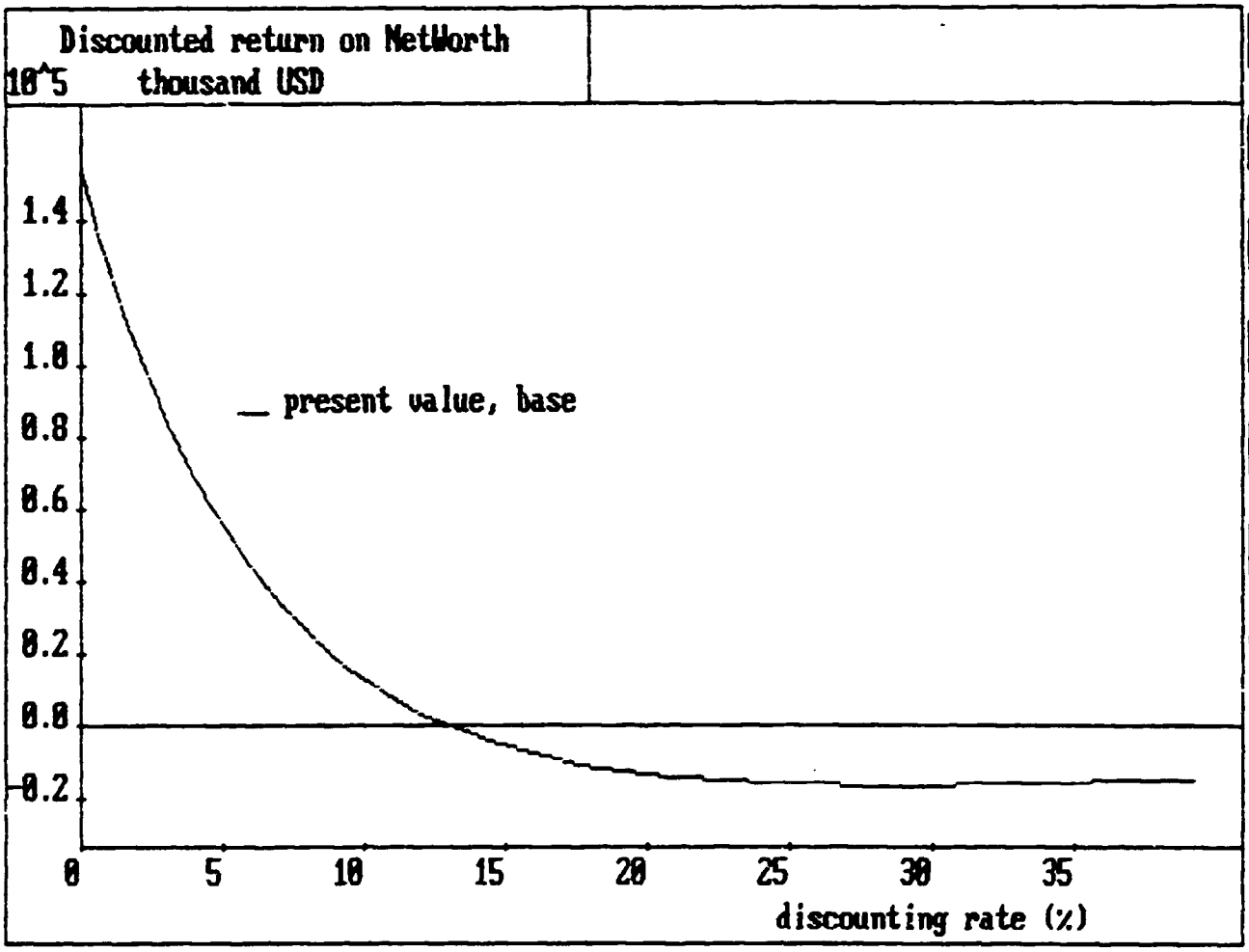

Discounted CF, Investment
10^5 thousand USD
2.0
1.5
1.0
0.5
0.0
-0.5
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

COMFAR 2.1

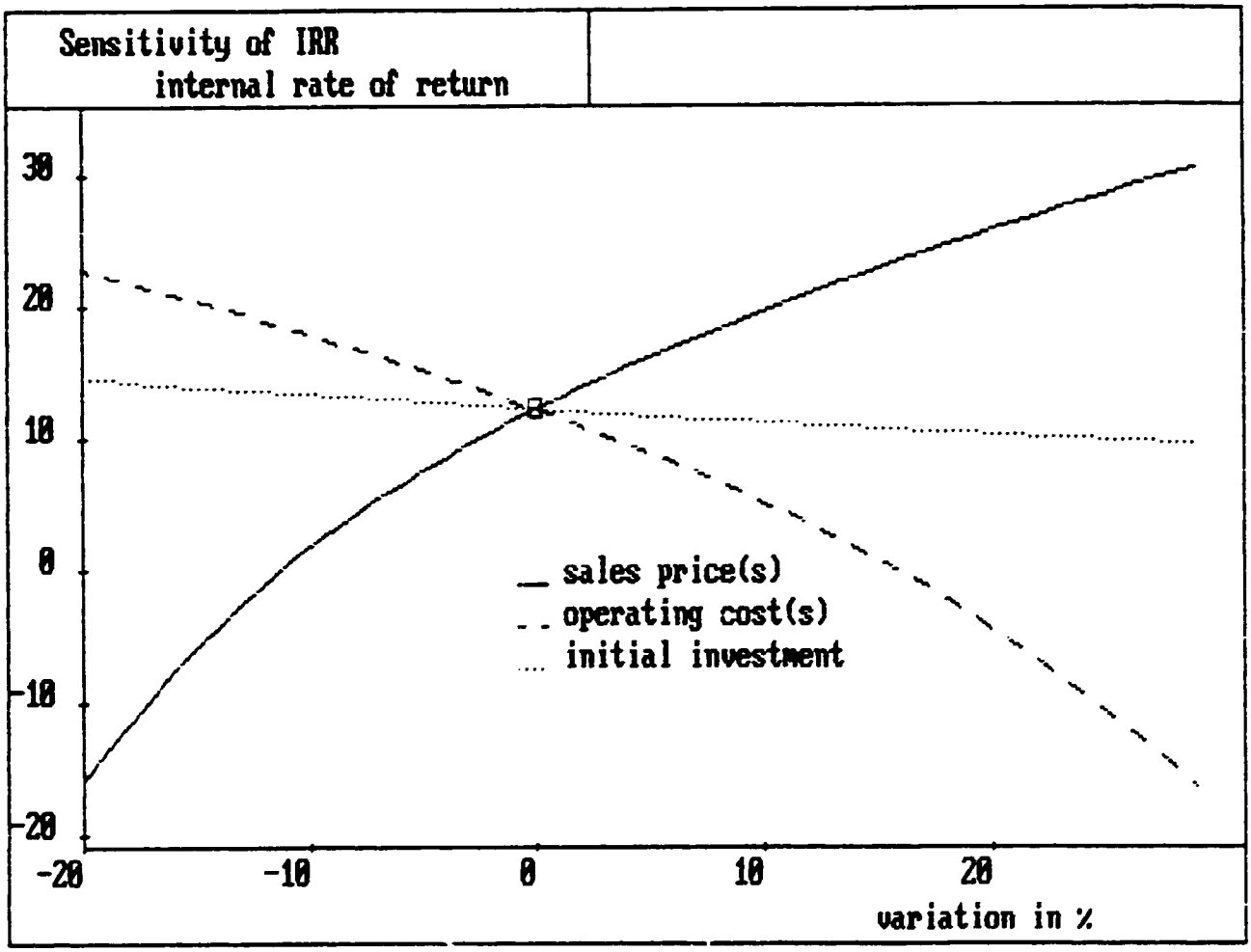

Discounted CF, Investment
var. of initial investment costs
10^5 thousand USD
present value, base
+- 10 %
+- 20 %
+- 50 %
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
0
5
10
15
20
25
30
35
discounting rate (%)

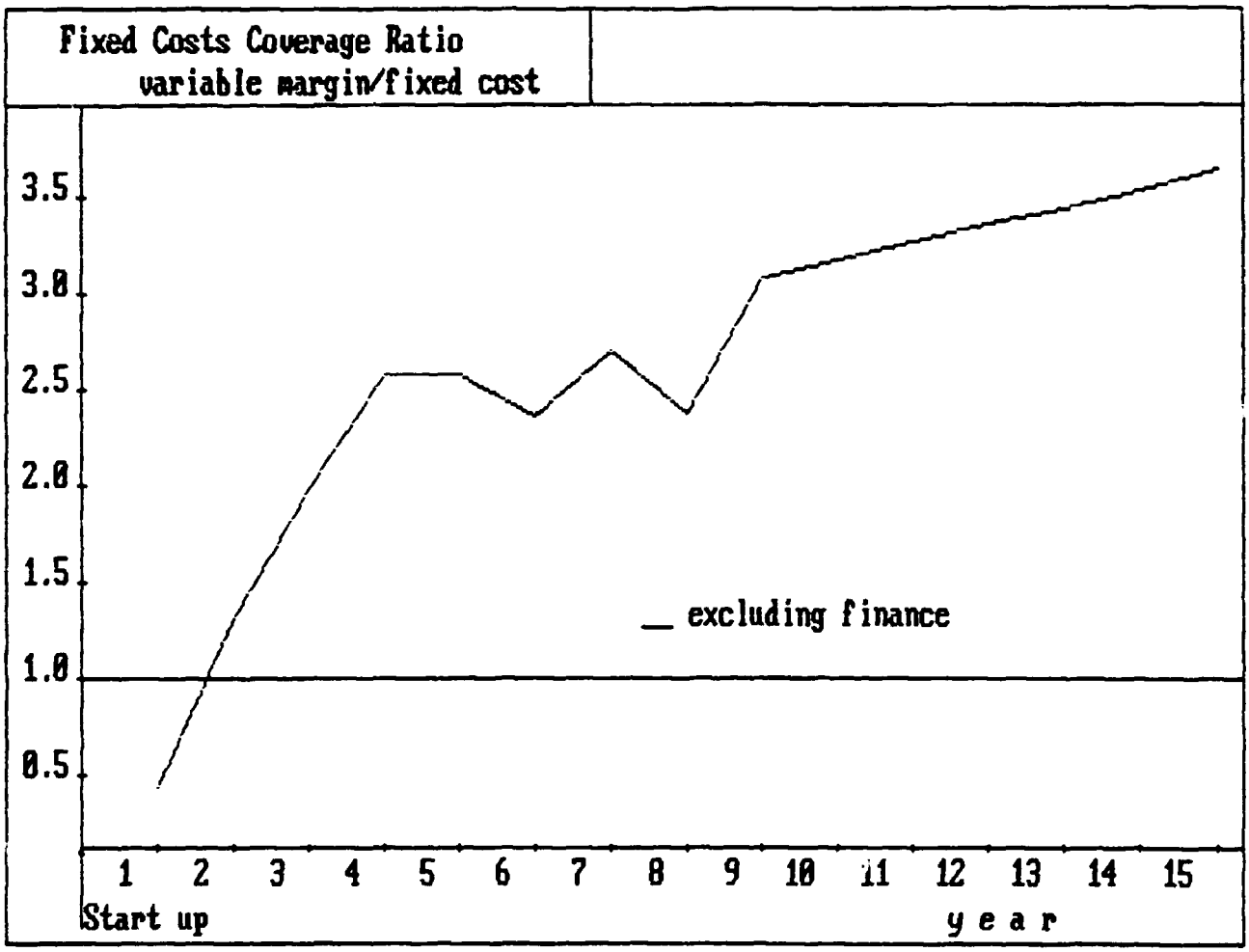

Discounted CF, Investment
variation of sales prices
10^5 thousand USD
present value, base
+- 10 %
+- 20 %
+- 30 %
6.0
4.0
2.0
0.0
-2.0
-4.0
0
5
10
15
20
25
30
35
discounting rate (%)


Discounted CF, Investment
10^5 thousand USD
variation of operating costs
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
present value, base
+- 10 %
+- 20 %
+- 30 %
0
5
10
15
20
25
30
35
discounting rate (%)

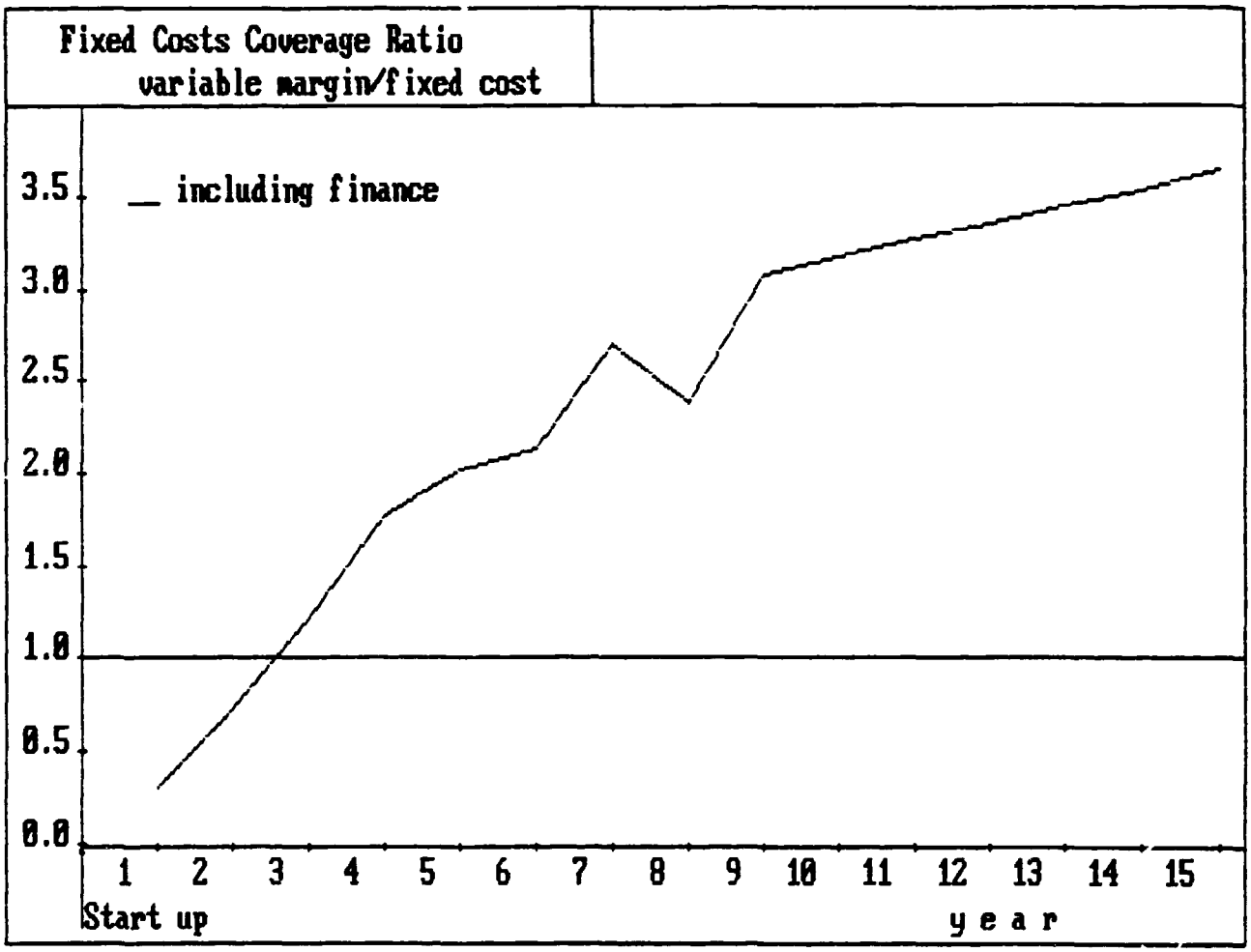

Discounted return on NetWorth
10^5 thousand USD
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

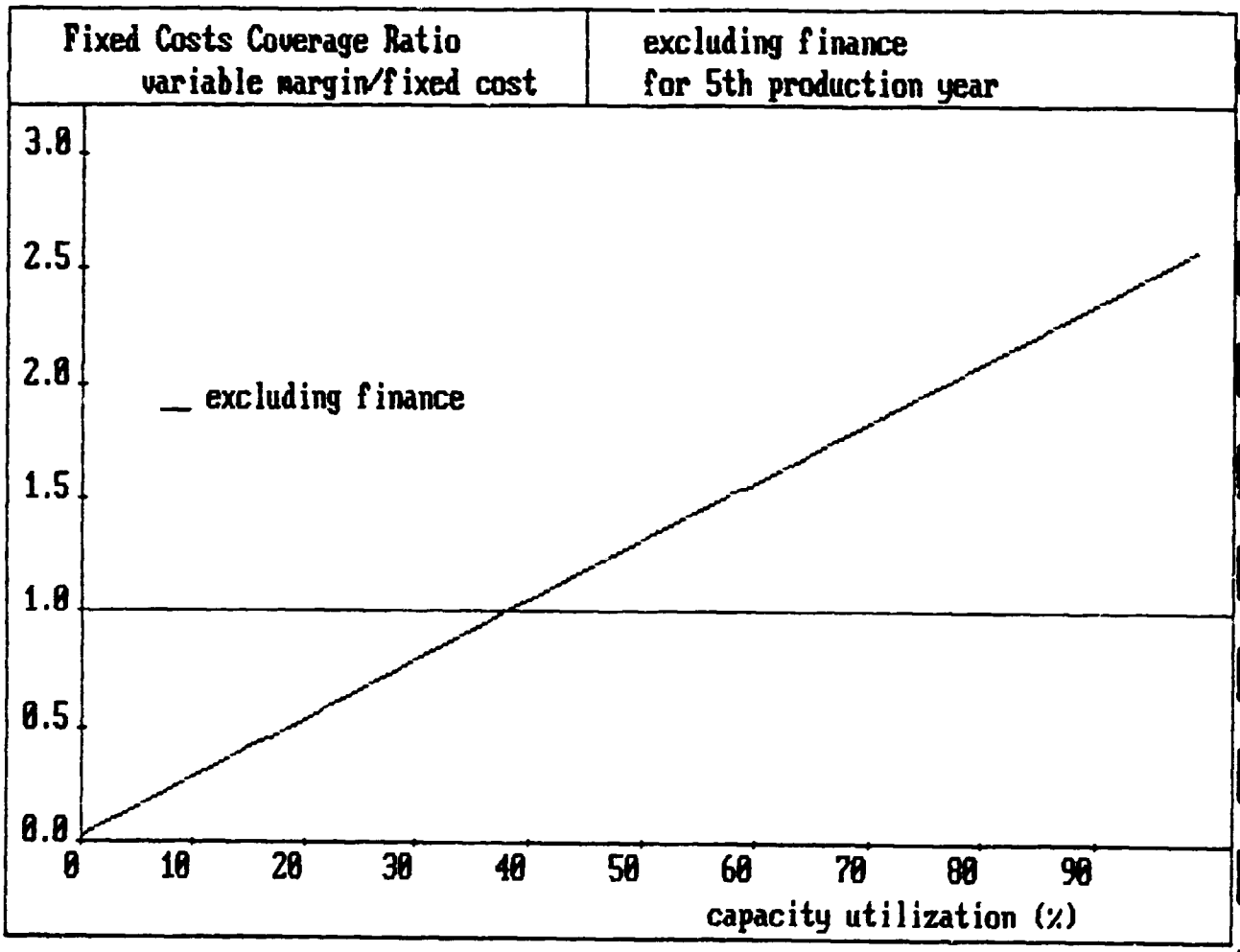

COMFA
UNIC

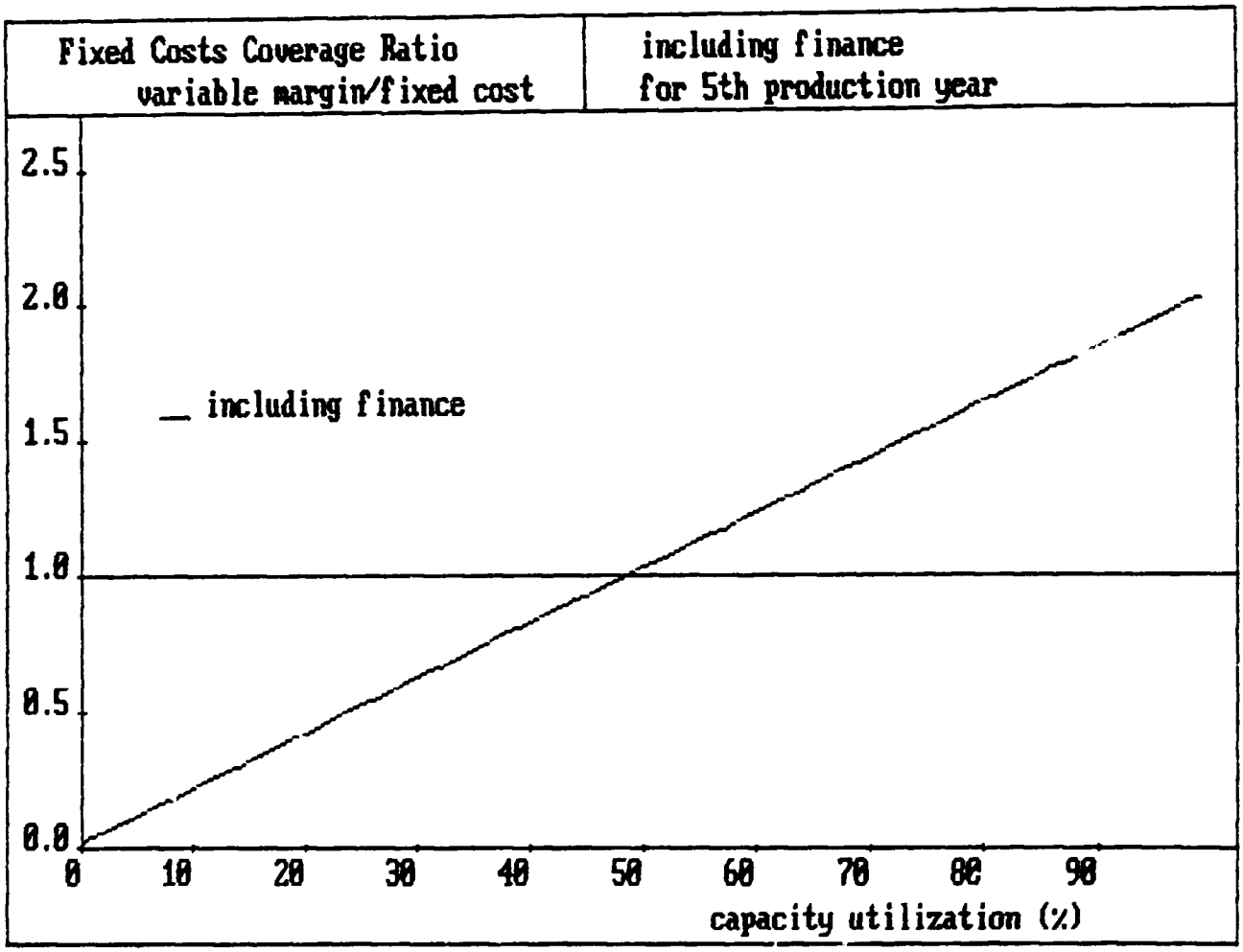

Sensitivity of IRR
internal rate of return
30
20
10
0
-10
-20
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment

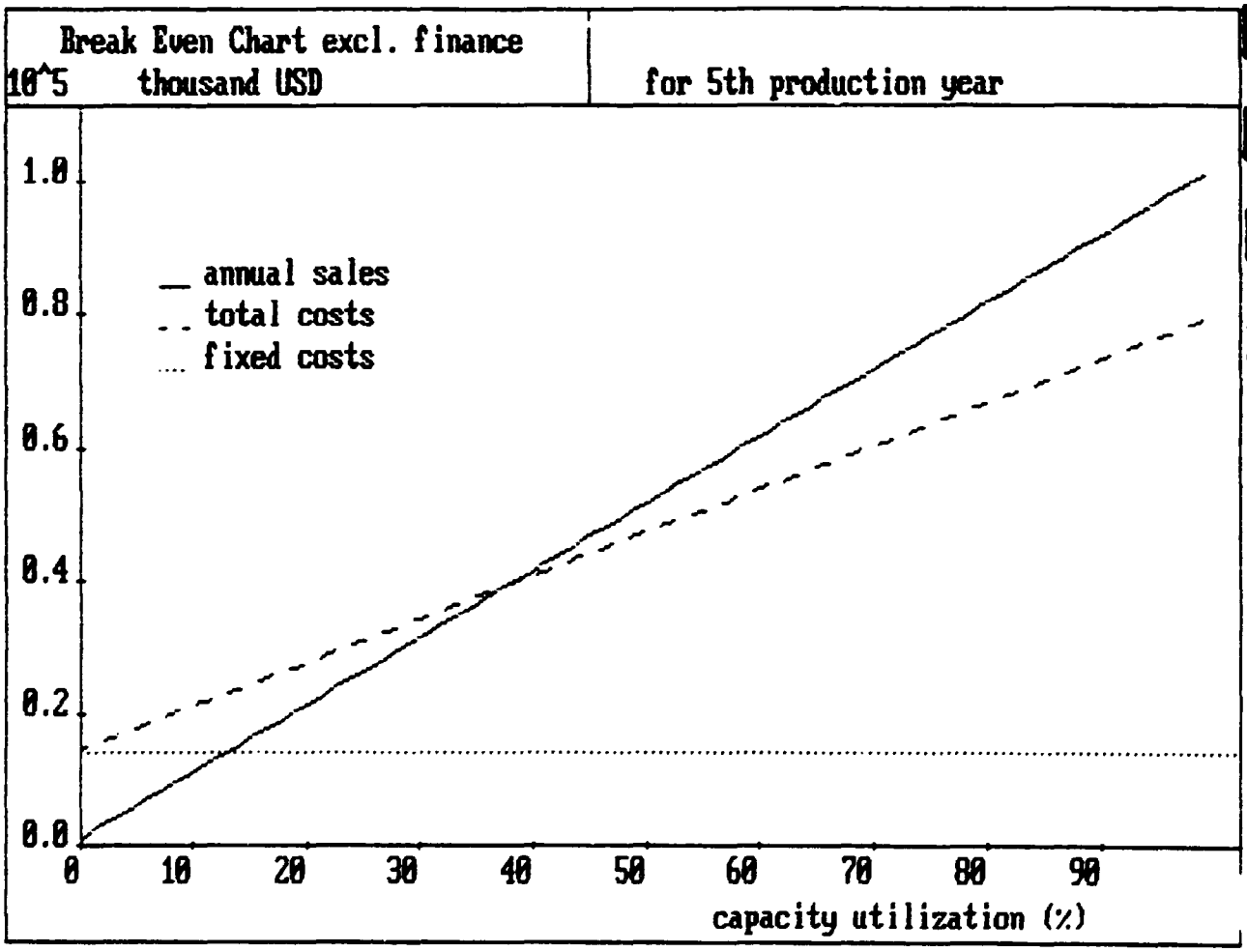

Fixed Costs Coverage Ratio
variable margin/fixed cost
3.5
3.0
2.5
2.0
1.5
1.0
0.5
excluding finance
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

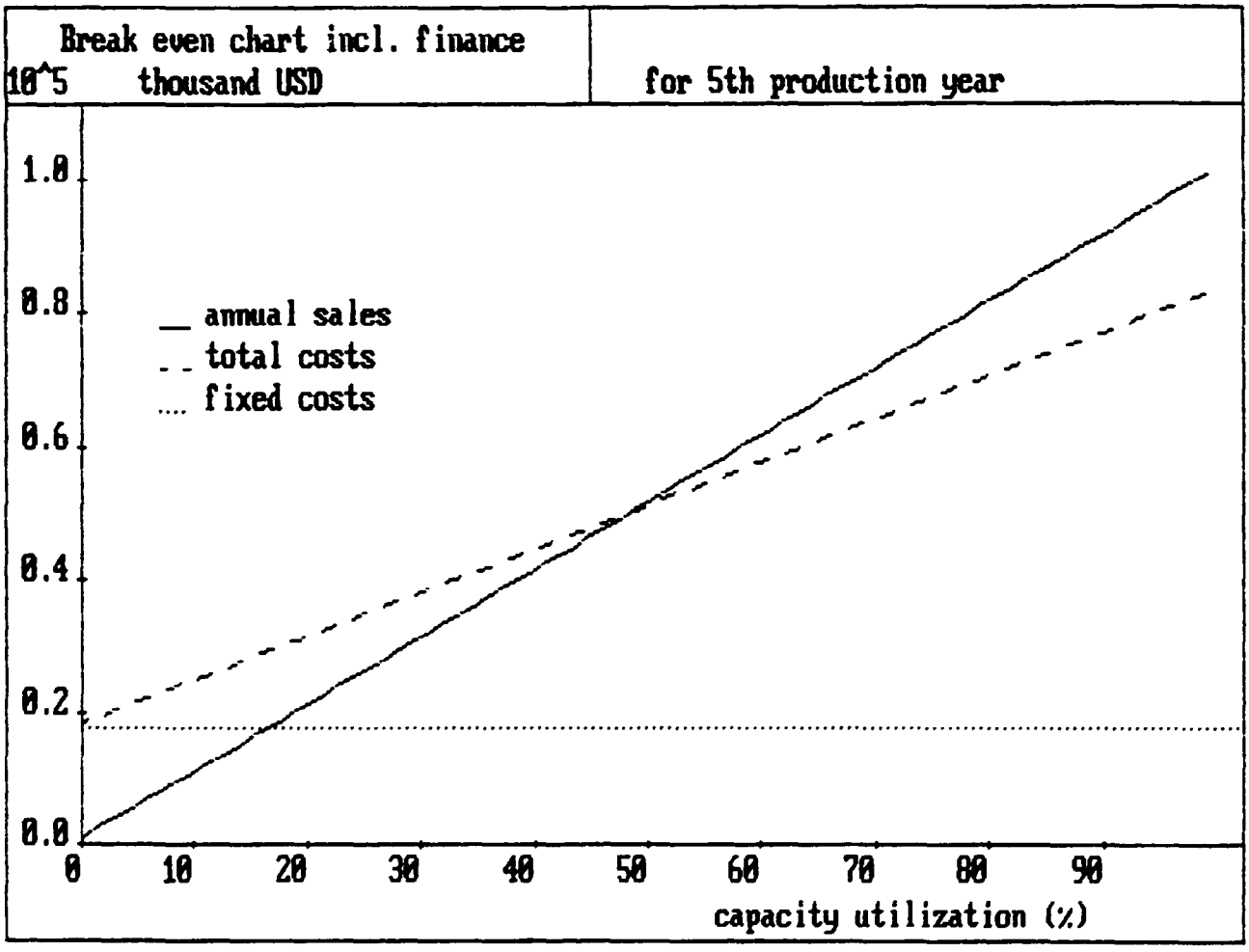

COMFA
2.1 UNIC


Fixed Costs Coverage Ratio
variable margin/fixed cost
__ including finance
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
excluding finance
for 5th production year
3.0
2.5
2.0
1.5
1.0
0.5
0.0
excluding finance
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Fixed Costs Coverage Ratio
variable margin/fixed cost
including finance
for 5th production year
2.5
2.0
1.5
1.0
0.5
0.0
including finance
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

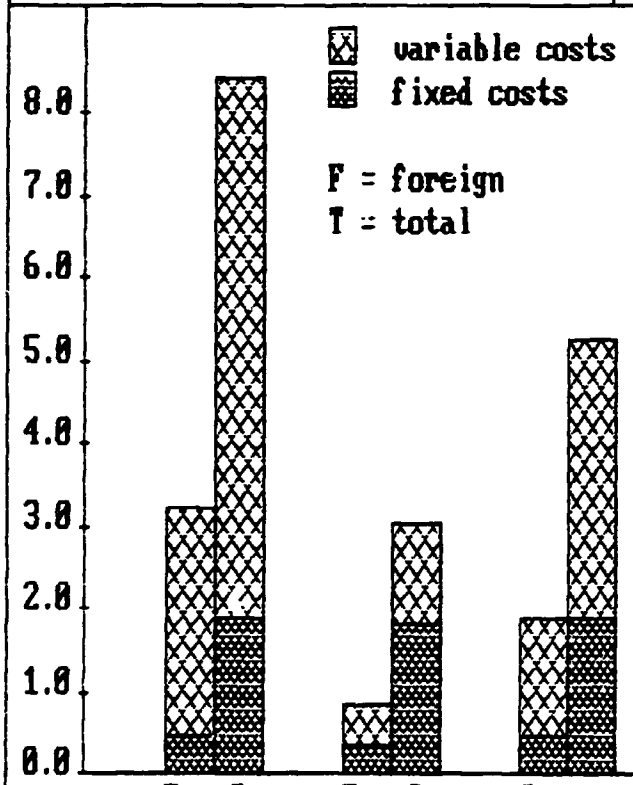

Break Even Chart excl. finance
10^5 thousand USD
for 5th production year
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break even chart incl. finance
10^5 thousand USD
for 5th production year
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

Structure of Production Costs

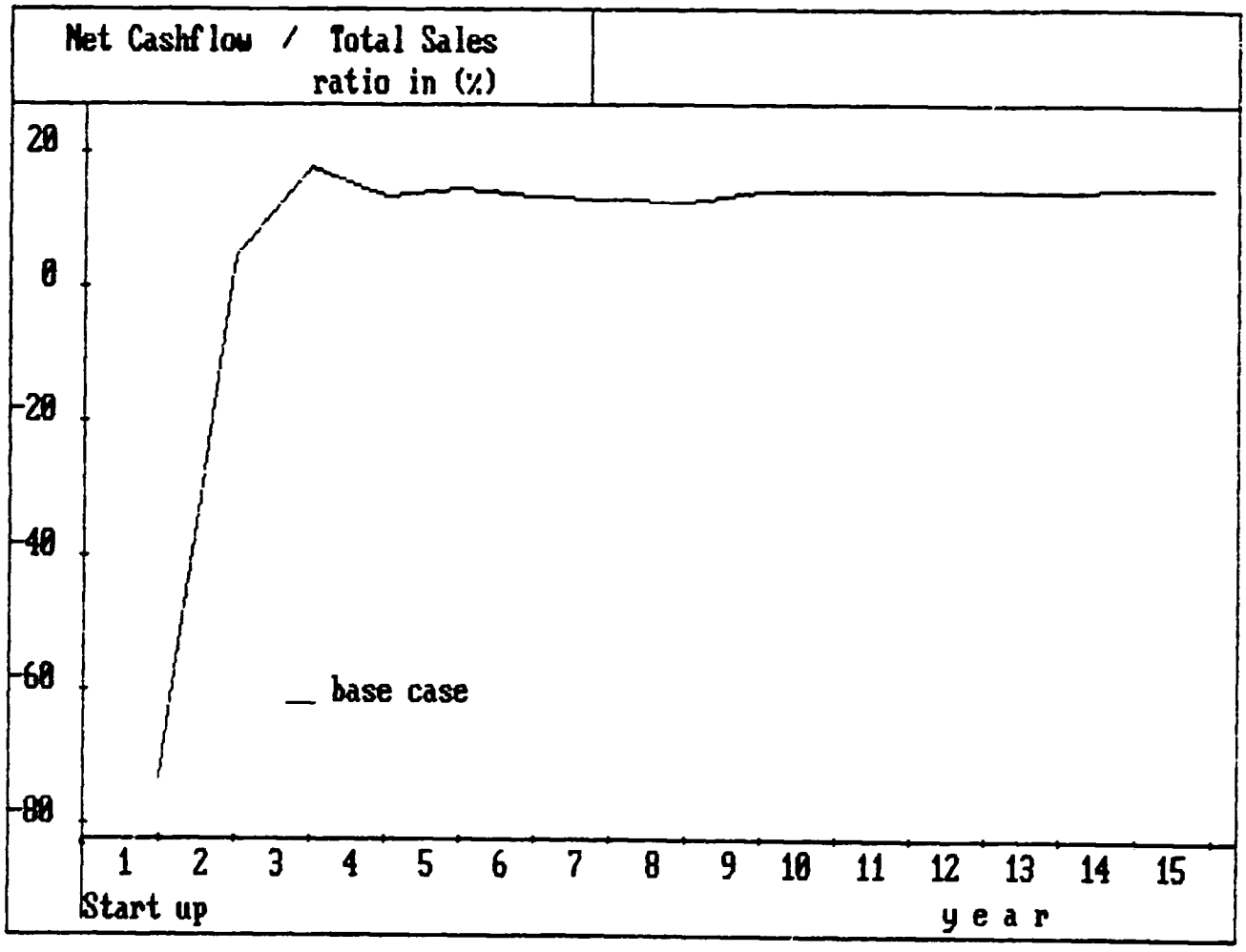
10^4 thousand USD

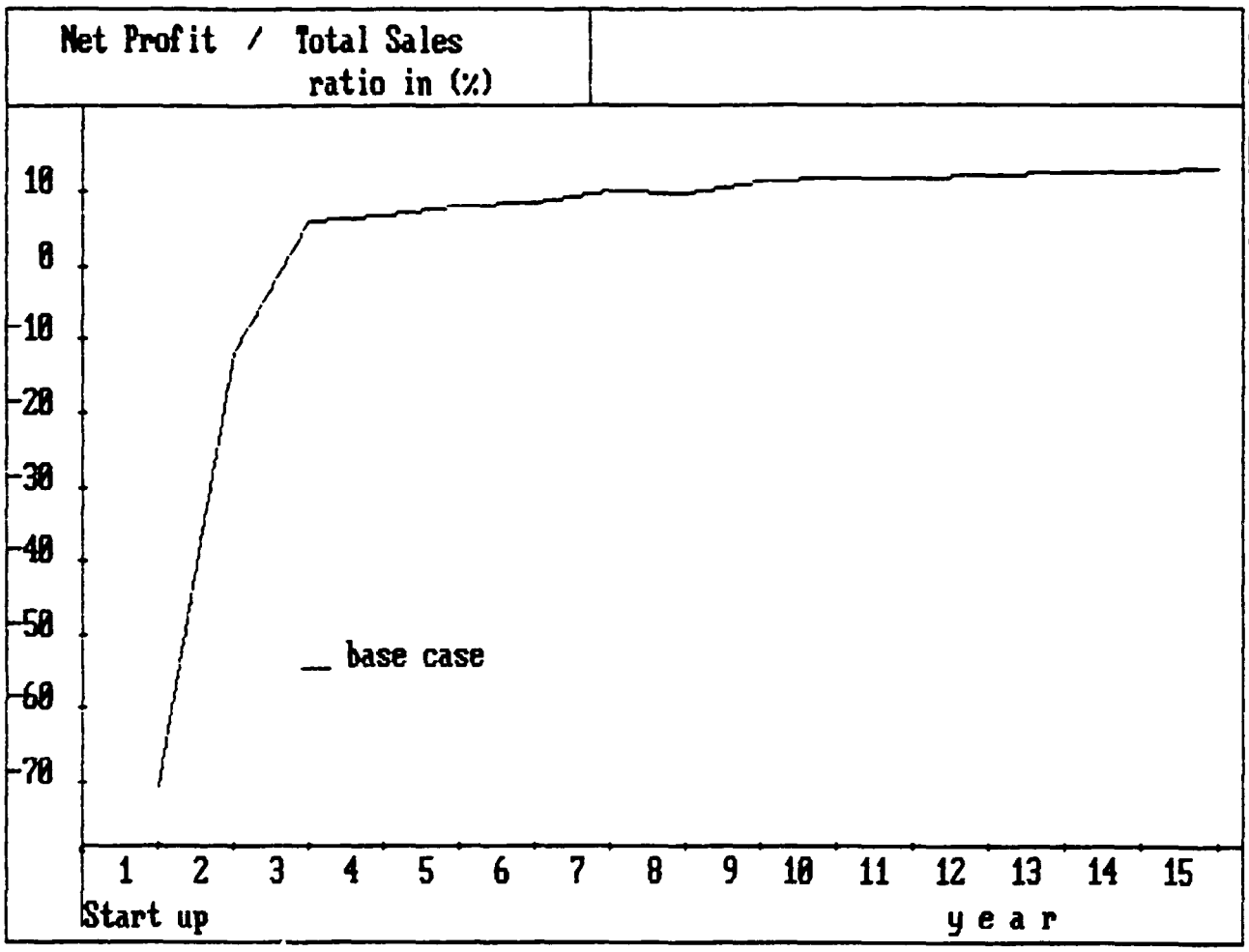
for 5th production year



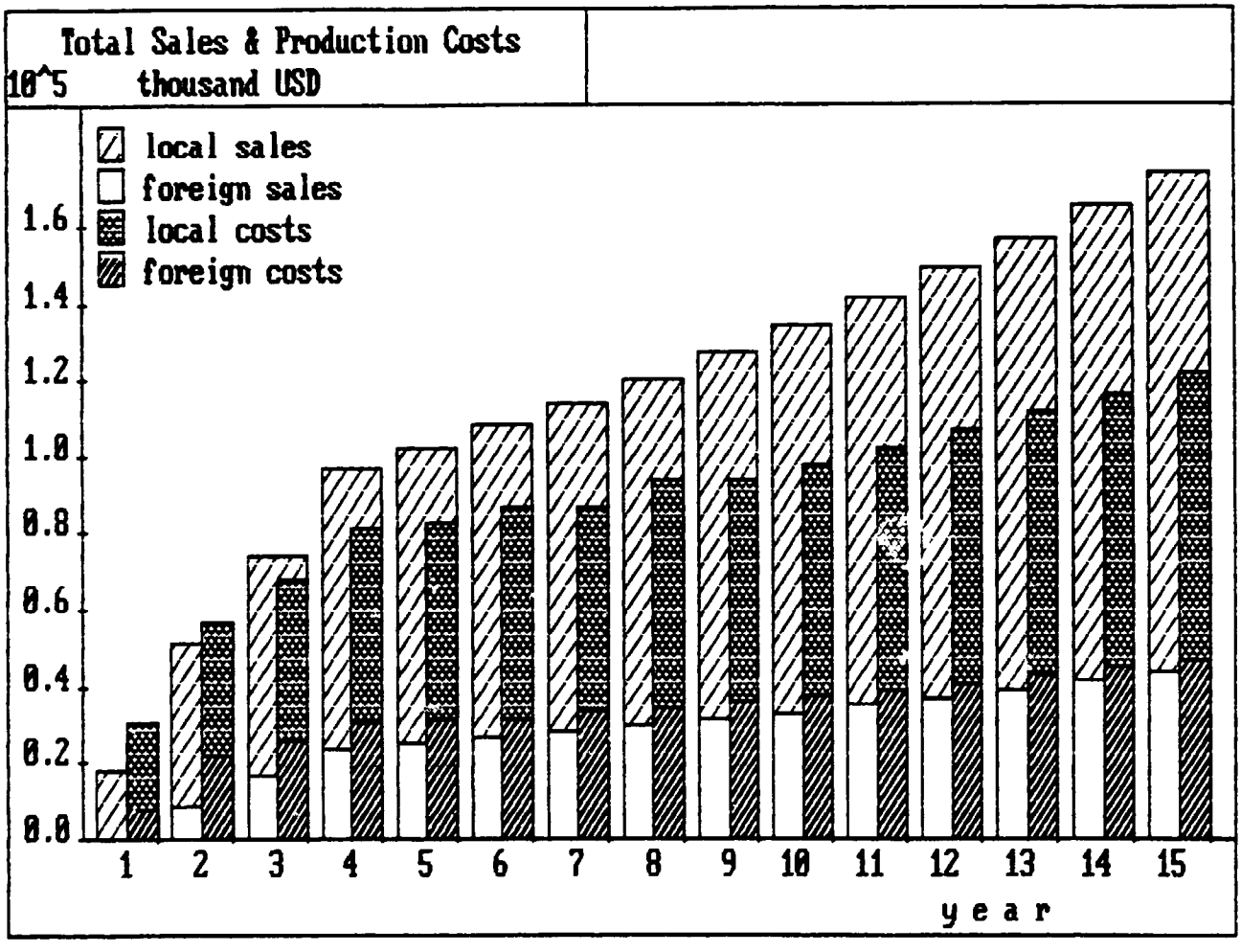
Nominal	Start up	
67.27	33.84	raw material
6.78	4.15	other RM
3.14	3.82	utilities
0.15	0.18	energy
1.11	4.18	labour
1.21	2.34	maintenance
0.96	0.74	spares
9.84	19.57	overheads
4.97	13.45	depreciation
4.56	17.73	interest
100.00	100.00	Total Prod C.


COMFA


Net Cashflow / Total Sales
ratio in (%)
20
0
-20
-40
-60
-80
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Net Profit / Total Sales
ratio in (%)
10
0
-10
-20
-30
-40
-50
-60
-70
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

COMFA


Total Sales & Production Costs
10^5 thousand USD
local sales
foreign sales
local costs
foreign costs
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
year

Results of Financial and Economical Analysis

VARIANT 2 A

3000 Trucks per year

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Prodaction road vehicles AKAKI Ethiopia
June 1993
Development of ASPF Ethiopia - var.2 A

3 year(s) of construction, 15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: thousand USD

Total initial investment during construction phase

fixed assets:	76300.00	43.145 % foreign
current assets:	350.00	100.000 % foreign
total assets:	76650.00	43.405 % foreign

Source of funds during construction phase

equity & grants:	0.00	0.000 % foreign
foreign loans :	43000.00	
local loans :	40480.00	
total funds :	83480.00	51.509 % foreign

Cashflow from operations

Year:	1	5	10
operating costs:	36316.10	137843.70	177675.80
depreciation :	4195.99	4379.27	4379.27
interest :	5667.20	4016.10	0.00
production costs	46179.29	146239.10	182055.00
thereof foreign	28.43 %	38.48 %	39.09 %
total sales :	40161.00	222206.70	293038.00
gross income :	-10758.29	53051.83	86131.56
net income :	-10758.29	23873.32	38759.28
cash balance :	-21263.75	4725.03	41296.33
net cashflow :	-15596.55	26237.80	41296.33

Net Present Value at: 11.50 % = 83110.48
Internal Rate of Return: 21.39 %
Return on equity1: 92.93 %
Return on equity2: 30.14 %

Index of Schedules produced by COMFAR

Total Initial Investment in thousand USD

Year	1995	1996	1997
Fixed investment costs			
Land, site preparation, development	950.000	420.000	0.000
Buildings and civil works	3950.000	9810.000	13540.000
Auxiliary and service facilities	1780.000	5070.000	6080.000
Incorporated fixed assets	220.000	270.000	340.000
Plant machinery and equipment	2220.000	12030.000	16720.000
Total fixed investment costs	9120.000	27600.000	36680.000
Pre-production capital expenditures	0.000	0.000	2900.000
Net working capital	0.000	0.000	350.000
Total initial investment costs	9120.000	27600.000	39930.000
Of it foreign, in %	24.342	43.587	47.633

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Total Current Investment in thousand USD

Year	1998	1999	2000	2001	2002
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	600.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	770.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	500.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	1340.000	0.000	0.000	0.000	0.000
Total fixed investment costs	3210.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	1580.000	0.000	0.000	0.000	0.000
Working capital	9911.454	5970.725	8477.037	5769.591	6030.897
Total current investment costs	14701.450	5970.725	8477.037	5769.591	6030.897
Of it foreign, %	46.651	41.588	42.650	44.503	47.039

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Total Current Investment in thousand USD

Year	2003	2004	2005	2006	2007
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	2845.967	1700.205	1706.732	1107.174	1842.150
Total current investment costs	2845.967	1700.205	1706.732	1107.174	1842.150
Of it foreign, %	27.510	77.977	8.123	71.133	44.890

Total Current Investment in thousand USD

Year	2008	2009	2010	2011	2012
Fixed investment costs					
Land, site preparation, development	0.000	0.000	0.000	0.000	0.000
Buildings and civil works	0.000	0.000	0.000	0.000	0.000
Auxiliary and service facilities	0.000	0.000	0.000	0.000	0.000
Incorporated fixed assets	0.000	0.000	0.000	0.000	0.000
Plant, machinery and equipment	0.000	0.000	0.000	0.000	0.000
Total fixed investment costs	0.000	0.000	0.000	0.000	0.000
Preproduction capitals expenditures.	0.000	0.000	0.000	0.000	0.000
Working capital	1934.258	2030.971	2132.531	2239.145	2351.109
Total current investment costs	1934.258	2030.971	2132.531	2239.145	2351.109
Of it foreign, %	44.890	44.890	44.890	44.890	44.890

Total Production Costs in thousand USD

Year	1998	1999	2000	2001	2002
% of nom. capacity (single product).	22.000	41.667	68.333	83.333	96.667
Raw material 1	20079.400	39930.620	68760.520	88047.020	107241.300
Other raw materials	2312.200	4379.167	7181.333	8758.333	10159.670
Utilities	2096.080	2689.050	3518.518	4104.938	4693.312
Energy	98.420	126.262	165.210	192.745	220.371
Labour, direct	1666.200	1211.875	911.584	1167.272	1421.737
Repair, maintenance	1223.800	1344.875	1497.379	1622.604	1750.734
Spares	320.000	332.000	344.600	357.830	918.699
Factory overheads	5100.000	5355.000	5622.749	5903.887	6199.081
Factory costs	32896.100	55368.850	88002.400	110154.600	132604.900
Administrative overheads	2710.000	2845.500	2987.775	3137.163	3294.021
Indir. costs, sales and distribution	710.000	745.500	782.775	821.914	863.009
Direct costs, sales and distribution	280.000	913.500	1146.602	1528.063	1847.563
Depreciation	4195.990	4379.270	4379.270	4379.270	4379.270
Financial costs	5667.200	10397.200	8270.166	6143.133	4016.100
Total production costs	46459.290	74649.820	105569.000	126164.200	147004.800
Costs per unit (single product)	70.393	59.720	51.497	50.466	50.691
Of it foreign, %	28.860	36.915	37.658	38.197	38.800
Of it variable,%	50.681	62.852	75.758	80.815	84.073
Total labour	2186.200	1757.875	1484.884	1769.237	2053.800

Total Production Costs in thousand USD

Year	2003	2004	2005	2006	2007
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	116486.200	122310.500	128426.000	134847.300	141589.700
Other raw materials	10510.000	10510.000	10510.000	10510.000	10510.000
Utilities	5028.548	5279.976	5543.974	5821.173	6112.231
Energy	236.112	247.918	260.314	273.329	286.996
Labour, direct	1544.300	1621.515	1702.591	1787.721	1877.106
Repair, maintenance	5870.895	1943.138	7218.424	2142.310	2249.425
Spares	386.308	1379.893	417.704	434.589	452.319
Factory overheads	6509.035	6834.486	7176.210	7535.021	7911.771
Factory costs	146571.400	150127.400	161255.200	163351.500	170989.500
Administrative overheads	3458.722	3631.659	3813.241	4003.903	4204.098
Indir. costs, sales and distribution	906.160	951.468	999.041	1048.993	1101.443
Direct costs, sales and distribution	2042.031	2144.156	2251.359	2363.938	2482.125
Depreciation	4379.270	4379.270	4379.270	4379.270	4379.270
Financial costs	1889.067	0.000	0.000	0.000	0.000
Total production costs	159246.600	161234.000	172698.100	175147.600	183156.500
Costs per unit (single product)	53.082	53.745	57.566	58.383	61.052
Of it foreign, %	37.577	39.509	38.073	39.356	39.458
Of it variable,%	83.039	86.674	84.615	87.258	87.284
Total labour	2207.967	2318.365	2434.283	2555.997	2683.797

COMFAR 2.1

Total Production Costs in thousand USD

Year	2008	2009	2010	2011	2012
% of nom. capacity (single product).	100.000	100.000	100.000	100.000	100.000
Raw material 1	148669.200	156102.600	163907.700	172103.100	180708.300
Other raw materials	10510.000	10510.000	10510.000	10510.000	10510.000
Utilities	6417.842	6738.734	7075.670	7429.454	7800.926
Energy	301.345	316.413	332.233	348.845	366.287
Labour, direct	1970.962	2069.510	2172.985	2281.634	2395.716
Repair, maintenance	2361.896	2479.991	2603.990	2734.190	2870.899
Spares	470.935	490.481	511.005	532.556	555.183
Factory overheads	8307.359	8722.727	9158.862	9616.806	10097.650
Factory costs	179009.500	187430.500	196272.500	205556.600	215304.900
Administrative overheads	4414.303	4635.018	4866.768	5110.106	5365.611
Indir. costs, sales and distribution	1156.515	1214.340	1275.057	1338.810	1405.751
Direct costs, sales and distribution	2606.250	2736.563	2873.375	3017.063	3167.875
Depreciation	4379.270	4379.270	4379.270	4379.270	4224.417
Financial costs	0.000	0.000	0.000	0.000	0.000
Total production costs	191565.800	200395.700	209666.900	219401.800	229468.600
Costs per unit (single product)	63.855	66.799	69.889	73.134	76.490
Of it foreign, %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Of it variable, %	37.309	37.333	37.356	37.378	37.458
Total labour	2817.987	2958.886	3106.830	3262.171	3425.280

COMFAR

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year	adc	coto	1998	1999	2000	2001	2002
Coverage							
Current assets &							
Accounts receivable	30	12.0	3421.342	5722.779	8901.629	11145.150	13396.620
Inventory and materials	58	6.2	6127.756	9782.435	15056.830	18535.630	21969.860
Energy	1	360.0	0.279	0.351	0.459	0.535	0.612
Spares	166	2.2	140.000	146.000	152.300	158.915	439.350
Work in progress	15	24.0	1370.671	2307.035	3666.767	4589.776	5525.203
Finished products	15	24.0	1483.588	2425.598	3791.257	4720.491	5662.454
Cash in hand	15	24.0	459.167	462.052	473.504	507.865	566.011
Total current assets			13002.800	20846.250	32042.750	39658.360	47560.110
Current liabilities and							
Accounts payable	30	12.0	2741.342	4614.071	7333.533	9179.552	11050.410
Net working capital			10261.460	16232.180	24709.220	30478.800	36509.700
Increase in working capital			9911.455	5970.725	8477.037	5769.588	6030.895
Net working capital, local			5523.054	9010.700	13872.290	17074.230	20268.230
Net working capital, foreign			4738.400	7221.478	10936.920	13404.580	16241.470

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

Production road vehicles AKAKI Ethiopia --- June

---------- COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Working Capital in thousand USD

Year	adc	coto	2003	2004	2005	2006	2007
Coverage							
Current assets &							
Accounts receivable	30	12.0	14727.360	15050.300	16005.740	16200.360	16377.270
Inventory and materials	58	6.2	23570.000	24541.420	25561.400	26632.390	27756.020
Energy	1	360.0	0.656	0.699	0.723	0.759	0.797
Spares	166	2.2	173.154	669.946	188.852	197.295	206.159
Work in progress	15	24.0	6107.142	6255.310	6710.960	6806.312	7124.563
Finished products	15	24.0	6251.255	6406.628	6877.354	6973.141	7299.734
Cash in hand	15	24.0	740.396	642.112	847.007	662.648	695.613
Total current assets			51569.950	53566.500	56200.550	57482.400	59961.050
Current liabilities and							
Accounts payable	30	12.0	12214.200	12510.620	13437.940	13612.620	14249.130
Net working capital			39355.670	41055.880	42762.610	43869.780	45711.930
Increase in working capital			2845.973	1700.203	1706.734	1107.172	1842.148
Net working capital, local			22331.270	22705.710	24273.800	24593.400	25608.610
Net working capital, foreign			17024.400	18350.170	18488.810	19276.380	20103.320

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

Net Working Capital in thousand USD

Year			2008	2009	2010	2011	2012
Coverage	adc	coto					
Current assets &							
Accounts receivable	30	12.0	17578.040	18313.960	19086.470	19897.710	20749.510
Inventory and materials	58	6.2	28937.690	30177.480	31479.270	32846.160	34281.380
Energy	1	360.0	0.837	0.879	0.923	0.969	1.017
Spares	166	2.2	215.467	225.241	235.503	246.278	257.592
Work in progress	15	24.0	7458.729	7809.603	8178.020	8564.857	8971.038
Finished products	15	24.0	7642.658	8002.728	8380.802	8777.779	9194.605
Cash in hand	15	24.0	730.228	766.572	804.734	844.804	886.878
Total current assets			62563.650	65296.370	68165.730	71178.550	74342.020
Current liabilities and							
Accounts payable	30	12.0	14917.460	15619.210	16356.040	17129.710	17942.080
Net working capital			47646.190	49677.160	51809.690	54048.840	56399.940
Increase in working capital			1934.262	2030.973	2132.523	2239.152	2351.098
Net working capital, local			26674.580	27793.850	28969.090	30203.080	31498.770
Net working capital, foreign			20971.610	21883.310	22840.610	23845.760	24901.170

Note: adc = minimum days of coverage ; coto = coefficient of turnover .

Source of Finance, construction in thousand USD

Year	1995
Equity, ordinary ..	0.000
Equity, preference.	0.000
Subsidies, grants .	0.000
Loan A, foreign .	43000.000
Loan B, foreign..	0.000
Loan C, foreign .	0.000
Loan A, local....	40480.000
Loan B, local....	0.000
Loan C, local....	0.000
Total loan	83480.000
Current liabilities	0.000
Bank overdraft	0.000
Total funds	83480.000

Source of Finance, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	-10750.000	-10750.000	-10750.000	-10750.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	0.000	-6746.667	-6746.667	-6746.667	-6746.667	-6746.667
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	0.000	-17496.670	-17496.670	-17496.670	-17496.670	-6746.667
Current liabilities	2741.342	1872.729	2719.462	1846.019	1870.853	1163.879
Bank overdraft	14433.760	21561.360	425.762	2172.059	-4725.043	-20925.550
Total funds	17175.100	5938.021	-14351.440	-13478.590	-20350.860	-26508.340

Source of Finance, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Equity, ordinary ..	0.000	0.000	0.000	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000	0.000	0.000	0.000
Loan A, local....	-6746.668	0.000	0.000	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000	0.000	0.000	0.000
Total loan	-6746.668	0.000	0.000	0.000	0.000	0.000
Current liabilities	296.336	927.317	174.687	636.504	668.331	701.748
Bank overdraft	12942.740	0.000	0.000	0.000	0.000	0.000
Total funds	10393.279	927.317	174.687	636.504	668.331	701.748

Source of Finance, production in thousand USD

Year	2010	2011	2012
Equity, ordinary ..	0.000	0.000	0.000
Equity, preference.	0.000	0.000	0.000
Subsidies, grants .	0.000	0.000	0.000
Loan A, foreign .	0.000	0.000	0.000
Loan B, foreign..	0.000	0.000	0.000
Loan C, foreign .	0.000	0.000	0.000
Loan A, local....	0.000	0.000	0.000
Loan B, local....	0.000	0.000	0.000
Loan C, local....	0.000	0.000	0.000
Total loan	0.000	0.000	0.000
Current liabilities	736.834	773.676	812.360
Bank overdraft	0.000	0.000	0.000
Total funds	736.834	773.676	812.360

Cashflow Tables, construction in thousand USD

Year	1995	1996	1997
Total cash inflow . .	83480.000	0.000	0.000
Financial resources .	83480.000	0.000	0.000
Sales, net of tax . .	0.000	0.000	0.000
Total cash outflow . .	9120.000	27600.000	39930.000
Total assets	9120.000	27600.000	39930.000
Operating costs . . .	0.000	0.000	0.000
Cost of finance . . .	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax . . .	0.000	0.000	0.000
Dividends paid . . .	0.000	0.000	0.000
Surplus (deficit) .	74360.000	-27600.000	-39930.000
Cumulated cash balance	74360.000	46760.000	6830.000
Inflow, local	40480.000	0.000	0.000
Outflow, local	6900.000	15570.000	20910.000
Surplus (deficit) .	33580.000	-15570.000	-20910.000
Inflow, foreign . . .	43000.000	0.000	0.000
Outflow, foreign . . .	2220.000	12030.000	19020.000
Surplus (deficit) .	40780.000	-12030.000	-19020.000
Net cashflow	-9120.000	-27600.000	-39930.000
Cumulated net cashflow	-9120.000	-36720.000	-76650.000

Cashflow tables, production in thousand USD

Year	1998	1999	2000	2001	2002	2003
Total cash inflow	38442.340	74048.720	129457.100	165154.500	201927.500	218497.000
Financial resources	2741.342	1872.729	2719.462	1846.019	1870.853	1163.878
Sales, net of tax	35701.000	72175.990	126737.600	163308.500	200056.700	217333.200
Total cash outflow	59706.100	95610.670	129882.900	167326.500	197202.500	197571.500
Total assets	17442.900	7843.454	11196.500	7615.608	7901.752	4009.846
Operating costs	36596.100	59873.350	92919.550	115641.800	138609.500	152978.300
Cost of finance	5667.200	10397.200	8270.166	6143.133	4016.100	1889.067
Repayment	0.000	17496.670	17496.670	17496.670	17496.670	6746.667
Corporate tax	0.000	0.000	0.000	20429.370	29178.510	31947.580
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit)	-21263.750	-21561.950	-425.789	-2172.047	4725.047	20925.560
Cumulated cash balance	-14433.750	-35995.710	-36421.500	-38593.540	-33868.500	-12942.930
Inflow, local	37497.910	64314.680	102709.200	120185.800	135679.300	149025.900
Outflow, local	40570.070	56245.550	76823.350	107205.200	127923.700	138785.000
Surplus (deficit)	-3072.156	8069.129	25885.880	12980.590	7755.352	10240.890
Inflow, foreign	944.430	9734.046	26747.900	44968.750	66248.400	69471.100
Outflow, foreign	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Surplus (deficit)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Net cashflow	-15596.500	6331.017	25041.040	21467.750	36237.000	39961.200
Cumulated net cashflow	-92246.550	-85914.540	-60873.500	-39405.750	-3168.750	36792.450

Cashflow tables, production in thousand USD

Year	2004	2005	2006	2007	2008	2009
Total cash inflow . .	229704.400	242971.500	255593.600	269924.500	284608.300	300026.200
Financial resources .	317.102	927.317	259.727	636.504	668.331	701.748
Sales, net of tax . .	229387.300	242044.200	255333.900	269288.000	283939.900	299324.400
Total cash outflow . .	203103.000	209093.300	216237.700	228623.200	240594.900	253159.900
Total assets	1996.541	2634.051	1281.857	2478.653	2602.592	2732.721
Operating costs . . .	156854.700	168318.900	170768.300	178777.200	187186.500	196016.400
Cost of finance . . .	0.000	0.000	0.000	0.000	0.000	0.000
Repayment	6767.434	0.000	85.041	0.000	0.000	0.000
Corporate tax . . .	37484.330	38140.320	44102.460	47072.360	50805.750	54410.830
Dividends paid . . .	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) .	26601.420	33878.220	39355.920	41296.340	44013.410	46866.280
Cumulated cash balance	13658.490	47536.710	86892.630	128189.000	172202.400	219068.700
Inflow, local	156344.100	165667.800	173896.600	183700.200	193630.200	204056.700
Outflow, local	139923.000	145201.900	148424.200	157424.000	165830.500	174657.300
Surplus (deficit) .	16421.130	20465.930	25472.410	26276.160	27799.670	29399.360
Inflow, foreign . . .	73360.330	77303.730	81697.310	86224.340	90978.070	95969.460
Outflow, foreign . . .	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Surplus (deficit) .	10180.290	13412.090	13883.530	15020.190	16213.710	17466.360
Net cashflow	33348.090	33878.220	39355.930	41296.350	44013.390	46866.280
Cumulated net cashflow	50041.340	83919.550	123275.500	164571.000	208585.200	255451.500

Cashflow tables, production In thousand USD

Year	2010	2011	2012
Total cash inflow	316215.000	333213.200	351061.300
Financial resources	736.834	773.676	812.360
Sales, net of tax	315478.100	332439.500	350248.900
Total cash outflow	268353.200	280206.100	294836.900
Total assets	2869.360	3012.825	3163.464
Operating costs	205287.790	215022.500	225244.200
Cost of finance	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	58196.160	62170.710	66429.200
Dividends paid	0.000	0.000	0.000
Surplus (deficit)	47861.780	53007.130	56224.440
Cumulated cash balance	268930.400	321937.600	378162.000
Inflow, local	215004.500	226499.700	238569.700
Outflow, local	183925.500	193657.000	203960.300
Surplus (deficit)	31079.060	32842.720	34609.340
Inflow, foreign	101210.400	106713.500	112491.600
Outflow, foreign	84427.900	86548.500	90876.600
Surplus (deficit)	16782.700	20164.970	21615.000
Net cashflow	47861.770	53007.120	56224.420
Cumulated net cashflow	305313.000	358320.400	414544.800

Cashflow Discounting:

a) Equity paid versus Net Income flow:
Net present value ..... 123672.80 at 11.50 %
Internal Rate of Return (IRRE1) .. 92.93 %
b) Net Worth versus Net cash return:
Net present value ..... 83523.63 at 11.50 %
Internal Rate of Return (IRRE2) .. 30.14 %
c) Internal Rate of Return on total investment:
Net present value .... 83110.48 at 11.50 %
Internal Rate of Return (IRR) .. 21.39 %
Net Worth = Equity paid plus reserves

Net Income Statement in thousand USD

Year	1998	1999	2000	2001	2002
Total sales, incl. sales tax	40161.000	80975.000	140637.600	181408.500	222206.700
Less: variable costs, incl. sales tax.	28006.100	55762.350	93983.610	120268.000	146069.100
Variable margin	12154.900	25213.640	46654.020	61140.450	76137.590
As % of total sales	30.265	31.137	33.173	33.703	34.264
Non-variable costs, incl. depreciation	17245.000	17200.270	17215.200	17853.000	19069.660
Operational margin	-5091.094	7923.371	29438.810	43287.450	57067.940
As % of total sales	-12.677	9.785	20.932	23.862	25.682
Cost of finance	5667.200	10397.200	8270.166	6143.133	4016.100
Gross profit	-10758.290	-2473.828	21168.650	37144.310	53051.830
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	-10758.290	-2473.828	21168.650	37144.310	53051.830
Tax	0.000	0.000	0.000	20429.370	29178.510
Net profit	-10758.290	-2473.828	21168.650	16714.940	23873.320
Dividends paid	0.000	0.000	0.000	0.000	0.000
Retained profit	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Accumulated undistributed profit	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Gross profit, % of total sales	-26.788	-3.055	15.052	20.476	23.875
Net profit, % of total sales	-26.788	-3.055	15.052	9.214	10.744
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	-5.573	8.141	27.825	20.488	23.716

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA -

Net Income Statement in thousand USD

Year	2003	2004	2005	2006	2007
Total sales, incl. sales tax	241083.200	253137.300	265794.200	279083.900	293038.000
Less: variable costs, incl. sales tax.	157861.500	164041.500	170530.600	177344.100	184498.300
Variable margin	83221.700	89095.780	95263.560	101739.700	108539.700
As % of total sales	34.520	35.197	35.841	36.455	37.039
Non-variable costs, incl. depreciation	23246.120	20942.450	25917.530	21553.440	22408.160
Operational margin	59975.580	68153.330	69346.030	80186.300	86131.560
As % of total sales	24.878	26.923	26.090	28.732	29.393
Cost of finance	1889.067	0.000	0.000	0.000	0.000
Gross profit	58086.520	68153.330	69346.030	80186.300	86131.560
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	58086.520	68153.330	69346.030	80186.300	86131.560
Tax	31947.580	37484.330	38140.320	44102.460	47372.360
Net profit	26138.930	30669.000	31205.710	36083.830	38759.200
Dividends paid	1.000	1.000	1.000	1.000	1.000
Undistributed profit	26138.930	30669.000	31205.710	36083.830	38759.200
Accumulated undistributed profit	74663.720	105332.700	136538.400	172622.300	211381.500
Gross profit, % of total sales	24.094	26.923	26.090	28.732	29.393
Net profit, % of total sales	10.842	12.116	11.741	12.929	13.227
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	23.270	25.109	25.196	28.876	30.567

COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Net Income Statement in thousand USD

Year	2008	2009	2010	2011	2012
Total sales, incl. sales tax	307689.900	323074.400	339228.100	356189.500	373998.900
Less: variable costs, incl. sales tax.	192010.300	199897.800	208179.600	216875.600	226006.300
Variable margin	115679.700	123176.700	131048.500	139313.900	147992.600
As % of total sales	37.596	38.126	38.631	39.112	39.570
Non-variable costs, incl. depreciation	23305.590	24247.910	25237.310	26276.220	27212.220
Operational margin	92374.090	98928.780	105811.200	113037.700	120780.400
As % of total sales	30.022	30.621	31.192	31.735	32.294
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	92374.090	98928.780	105811.200	113037.700	120780.400
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	92374.090	98928.780	105811.200	113037.700	120780.400
Tax	50805.750	54410.830	58196.160	62170.710	66429.200
Net profit	41568.340	44517.950	47615.030	50866.950	54351.170
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	41568.340	44517.950	47615.030	50866.950	54351.170
Accumulated undistributed profit	252949.800	297467.800	345082.800	395949.700	450300.900
Gross profit, % of total sales	30.022	30.621	31.192	31.735	32.294
Net profit, % of total sales	13.510	13.779	14.036	14.281	14.532
ROE, Net profit, % of equity	0.000	0.000	0.000	0.000	0.000
ROI, Net profit+interest, % of invest.	32.200	34.044	35.820	37.641	39.531

Projected Balance Sheets, construction in thousand USD

Year	1995	1996	1997
Total assets	83480.000	83480.000	83480.000
Fixed assets, net of depreciation	0.000	9120.000	36720.000
Construction in progress	9120.000	27600.000	39580.000
Current assets	0.000	0.000	350.000
Cash, bank	0.000	0.000	0.000
Cash surplus, finance available	74360.000	46760.000	6830.000
Loss carried forward	0.000	0.000	0.000
Loss	0.000	0.000	0.000
Total liabilities	83480.000	83480.000	83480.000
Equity capital	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000
Profit	0.000	0.000	0.000
Long and medium term debt	83480.000	83480.000	83480.000
Current liabilities	0.000	0.000	0.000
Bank overdraft, finance required	0.000	0.000	0.000
Total debt	83480.000	83480.000	83480.000
Equity, % of liabilities	0.000	0.000	0.000

COMFA
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CONFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

Year	1998	1999	2000	2001	2002
Total assets	100655.100	106593.100	113410.300	103414.600	106937.000
Fixed assets, net of depreciation	72104.010	72514.730	68135.460	63756.190	59376.920
Construction in progress	4790.000	0.000	0.000	0.000	0.000
Current assets	12543.630	20384.200	31569.250	39150.400	46994.100
Cash, bank	459.167	462.052	473.504	507.365	566.011
Cash surplus, finance available	0.000	0.000	0.000	0.000	0.000
Loss carried forward	0.000	10758.290	13232.120	0.000	0.000
Loss	10758.290	2473.828	0.000	0.000	0.000
Total liabilities	100655.100	106593.100	113410.300	103414.600	106937.000
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	0.000	0.000	0.000	7936.527	24651.470
Profit	0.000	0.000	21168.650	16714.940	23873.320
Long and medium term debt	83400.000	85983.330	48486.660	30990.000	13493.330
Current liabilities	2741.342	4614.071	7333.533	9179.552	11050.410
Bank overdraft, finance required	14433.750	15995.710	36421.480	38593.540	33868.490
Total debt	100655.100	106593.100	92241.680	78763.090	58412.230
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

Prodaction road vehicles AKAKI Ethiopia --- Ju

CONFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

Projected Balance Sheets, Production in thousand USD

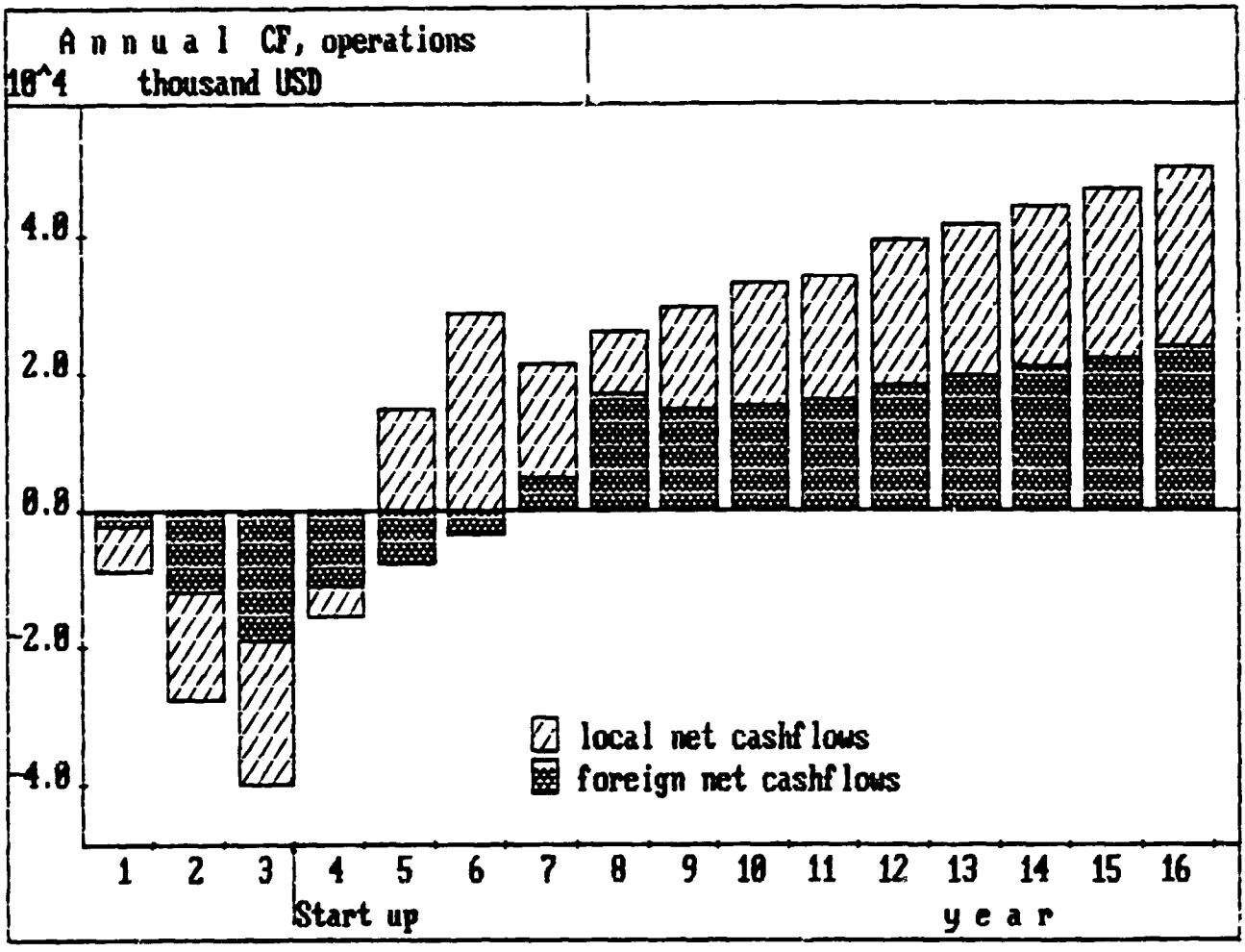
Year	2003	2004	2005	2006	2007
Total assets	106567.600	117843.300	149976.400	186234.900	225630.600
Fixed assets, net of depreciation	54997.650	50618.380	46239.110	41859.840	37480.570
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	50027.570	52024.300	55353.540	56819.750	59265.440
Cash, bank	740.306	642.112	847.007	662.648	695.613
Cash surplus, finance available	0.000	13658.460	47536.710	88092.650	128189.000
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	106567.600	117843.300	149976.400	186234.900	225630.600
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	40524.700	74663.720	105332.700	136538.400	172622.300
Profit	26130.930	30669.000	31205.710	36083.830	38750.200
Long and medium term debt	6746.667	-0.000	-0.000	-0.000	-0.000
Current liabilities	12214.280	12510.620	13437.040	13612.620	14249.130
Bank overdraft, finance required	12942.940	0.000	0.000	0.000	0.000
Total debt	31903.890	12510.620	13437.040	13612.620	14249.130
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

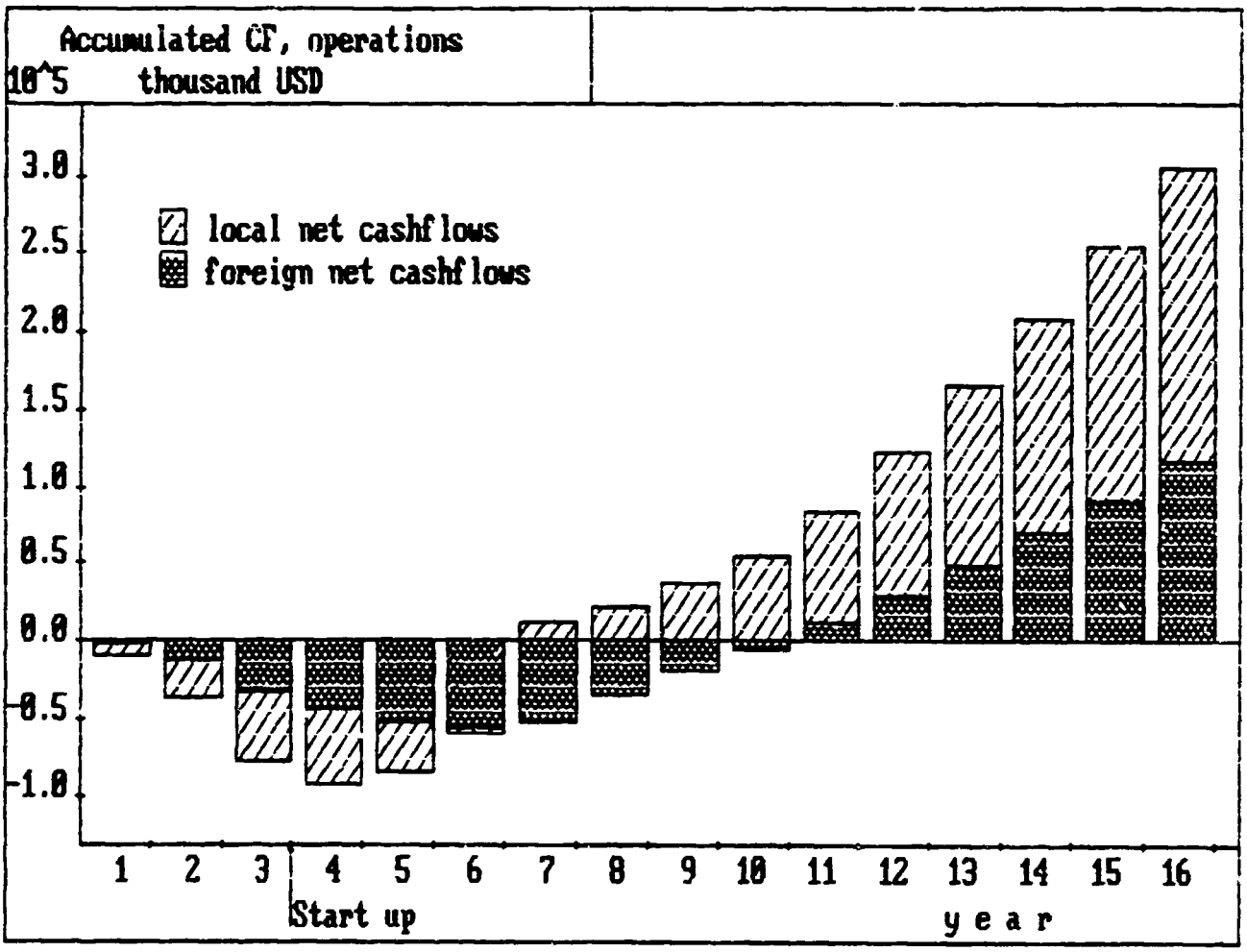
COMFA 2.1 UNIC

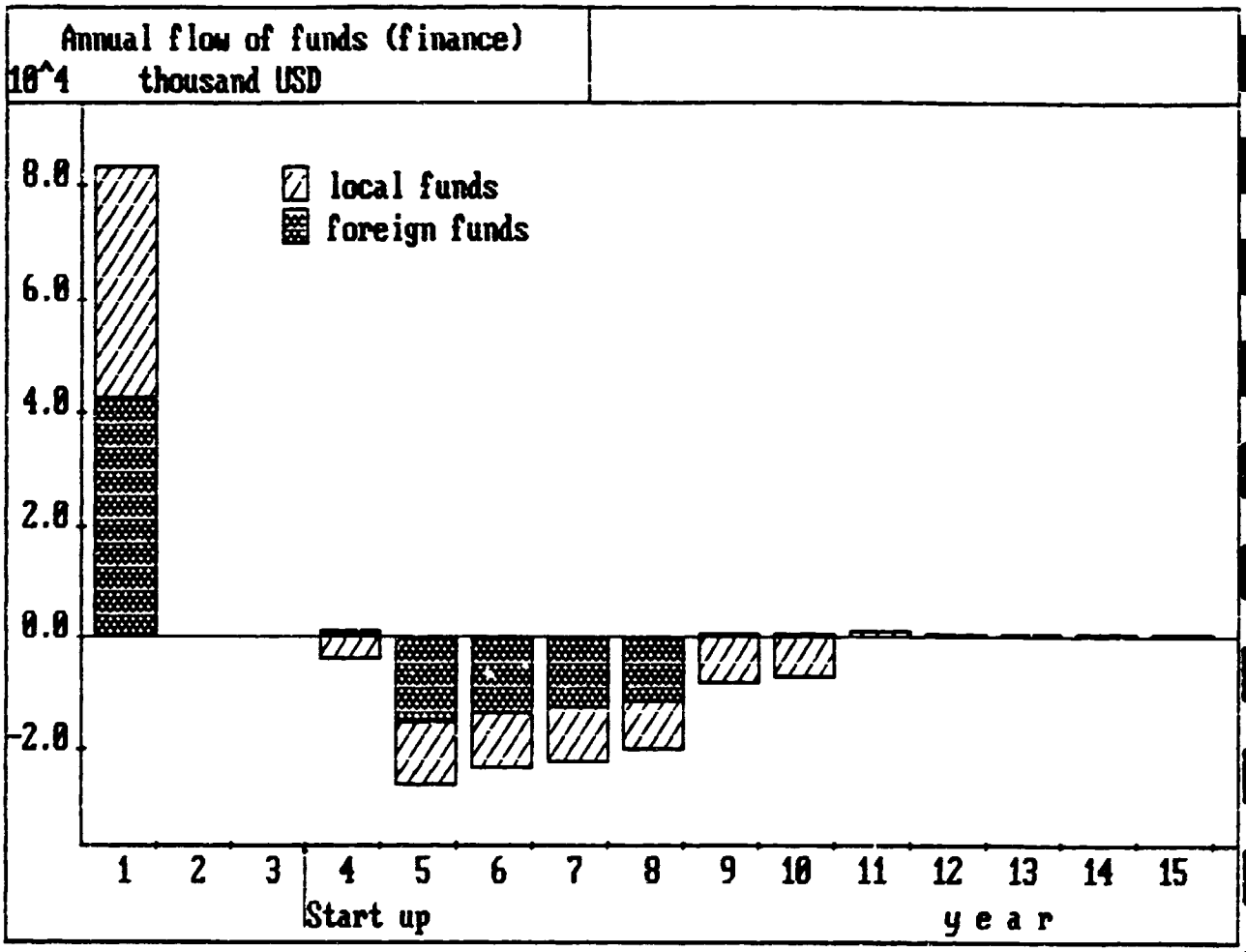
COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA -

Projected Balance Sheets, Production in thousand USD

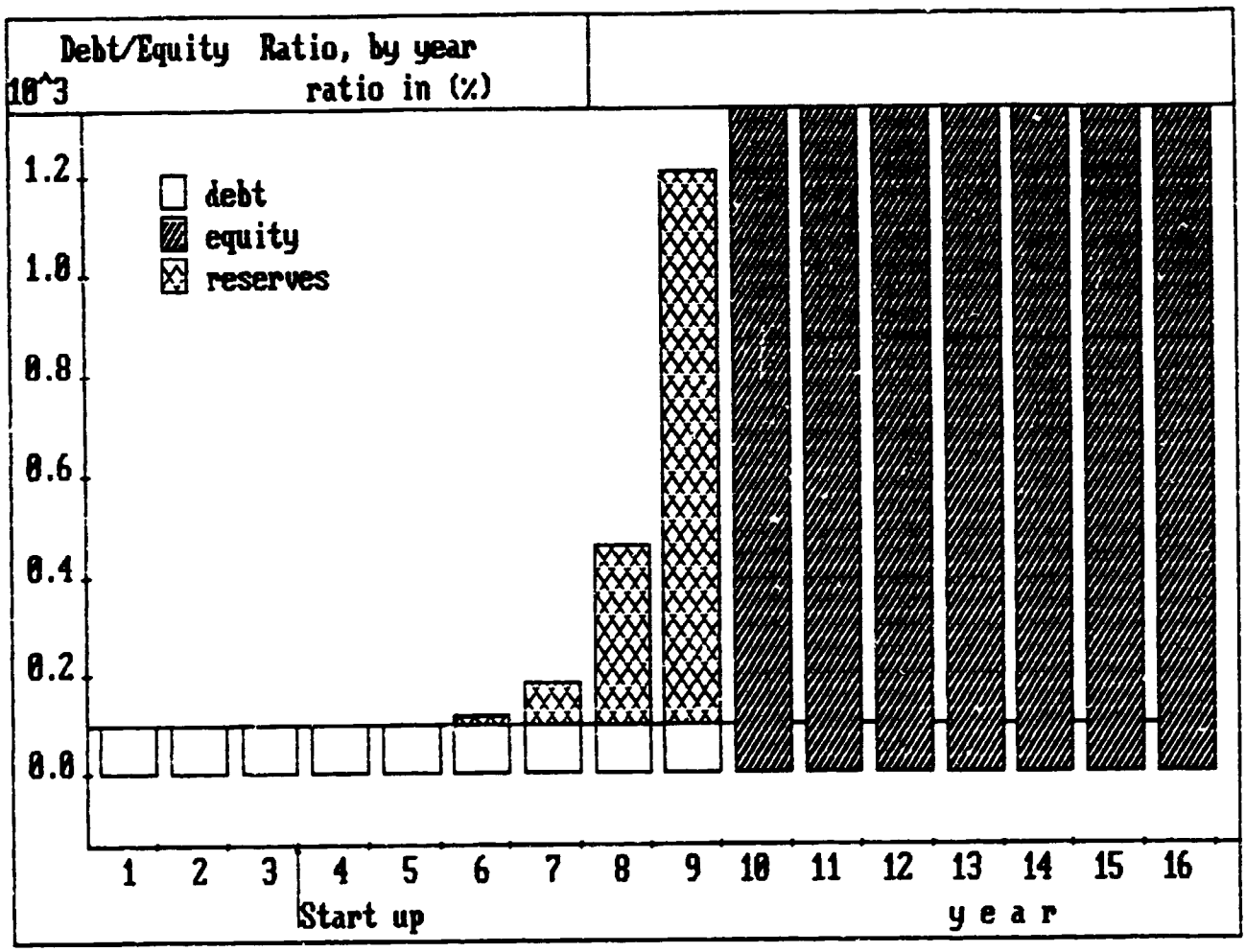
Year	2008	2009	2010	2011	2012
Total assets	267867.300	313087.000	361438.900	413079.400	468242.900
Fixed assets, net of depreciation	33101.300	28722.040	24342.770	19963.500	15739.080
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	61833.420	64529.790	67360.990	70333.750	73455.140
Cash, bank	730.220	766.572	804.734	844.804	886.878
Cash surplus, finance available	172202.300	219068.600	268930.300	321937.400	378161.800
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	267867.300	313087.000	361438.900	413079.400	468242.900
Equity capital	0.000	0.000	0.000	0.000	0.000
Reserves, retained profit	211381.500	252949.800	297467.800	345082.300	395049.700
Profit	41568.340	44517.950	47615.030	50866.950	54351.170
Long and medium term debt	-0.000	-0.000	-0.000	-0.000	-0.000
Current liabilities	14917.460	15619.210	16356.040	17129.710	17942.070
Bank overdraft, finance required	0.000	0.000	0.000	0.000	0.000
Total debt	14917.460	15619.210	16356.040	17129.710	17942.070
Equity, % of liabilities	0.000	0.000	0.000	0.000	0.000

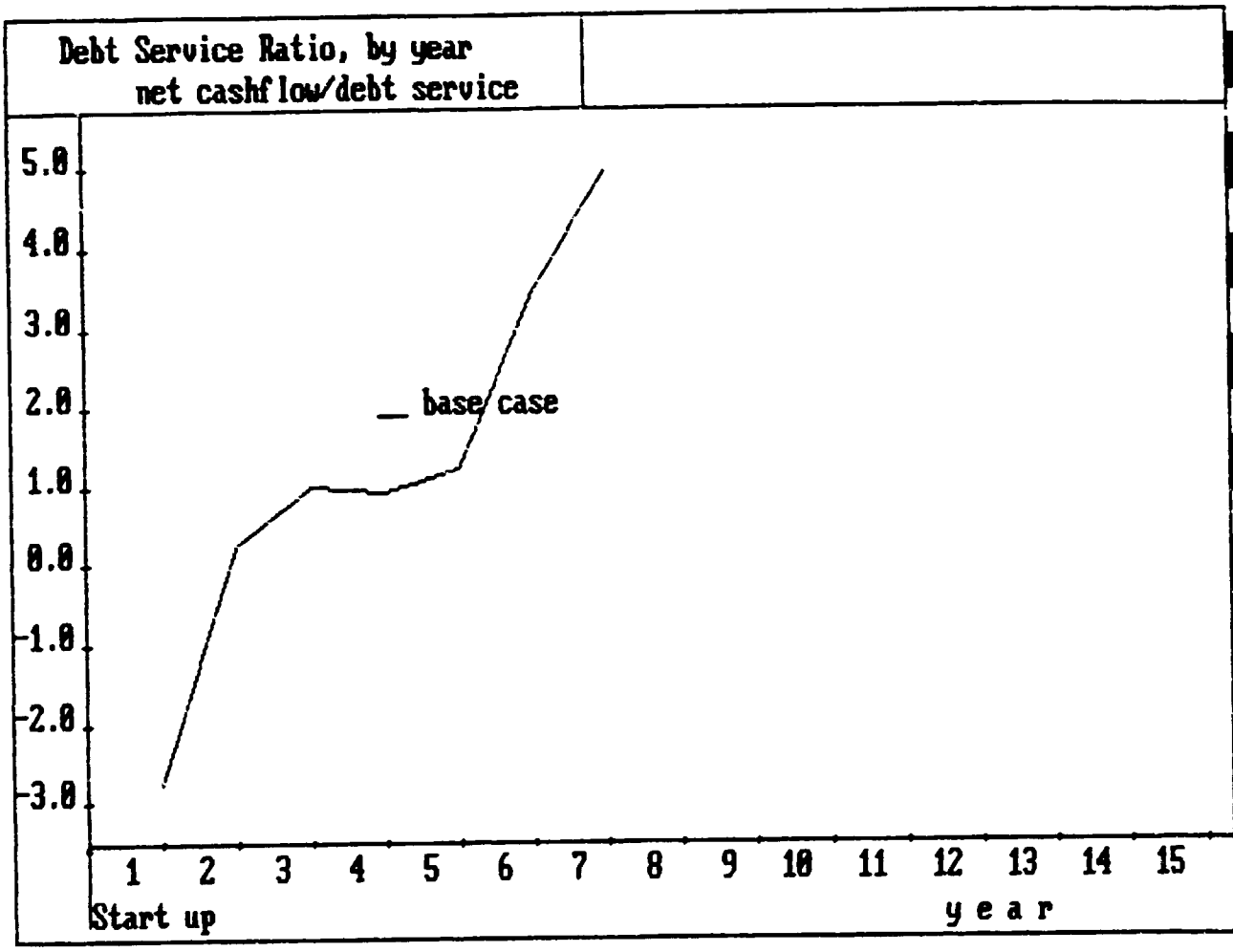

Annual CF, operations
10^4 thousand USD
4.0
2.0
0.0
-2.0
-4.0
local net cashflows
foreign net cashflows
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Start up
year

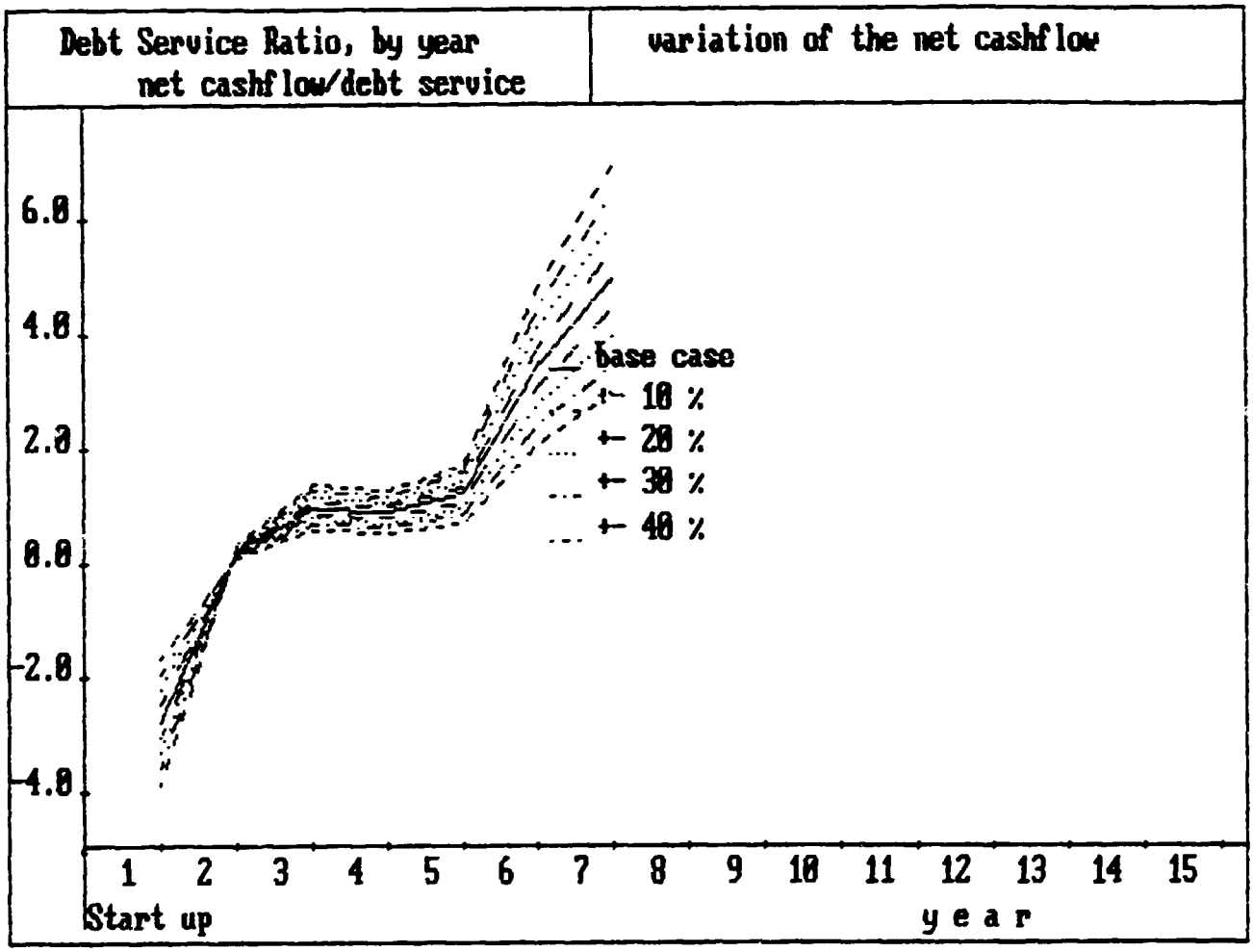


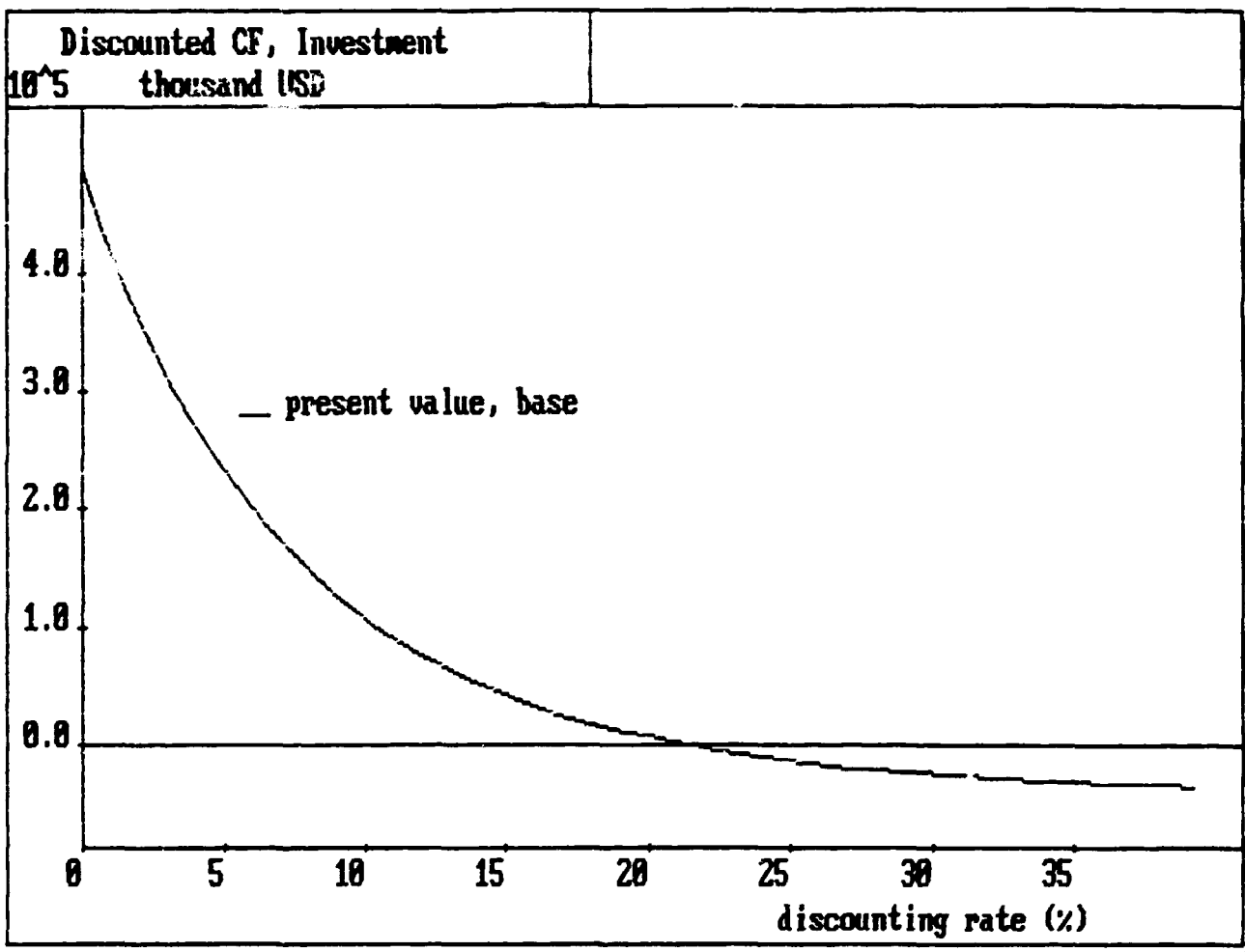

Annual flow of funds (finance)
10^4 thousand USD
local funds
foreign funds
8.0
6.0
4.0
2.0
0.0
-2.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year

COMFA
2.1 UNI

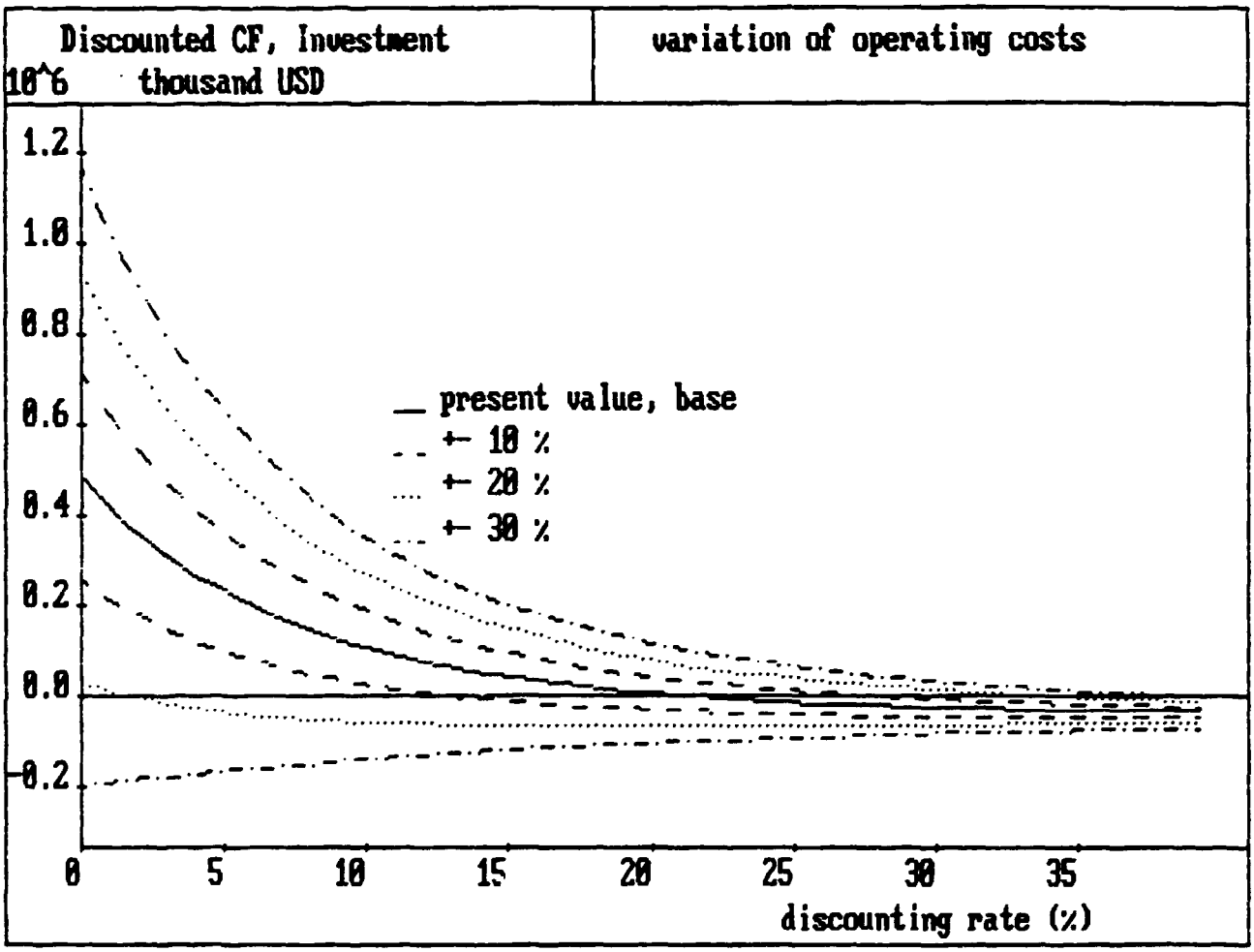

Debt/Equity Ratio, by year
10^3
ratio in (%)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
debt
equity
reserves
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Start up
year


Debt Service Ratio, by year
net cashflow/debt service
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year

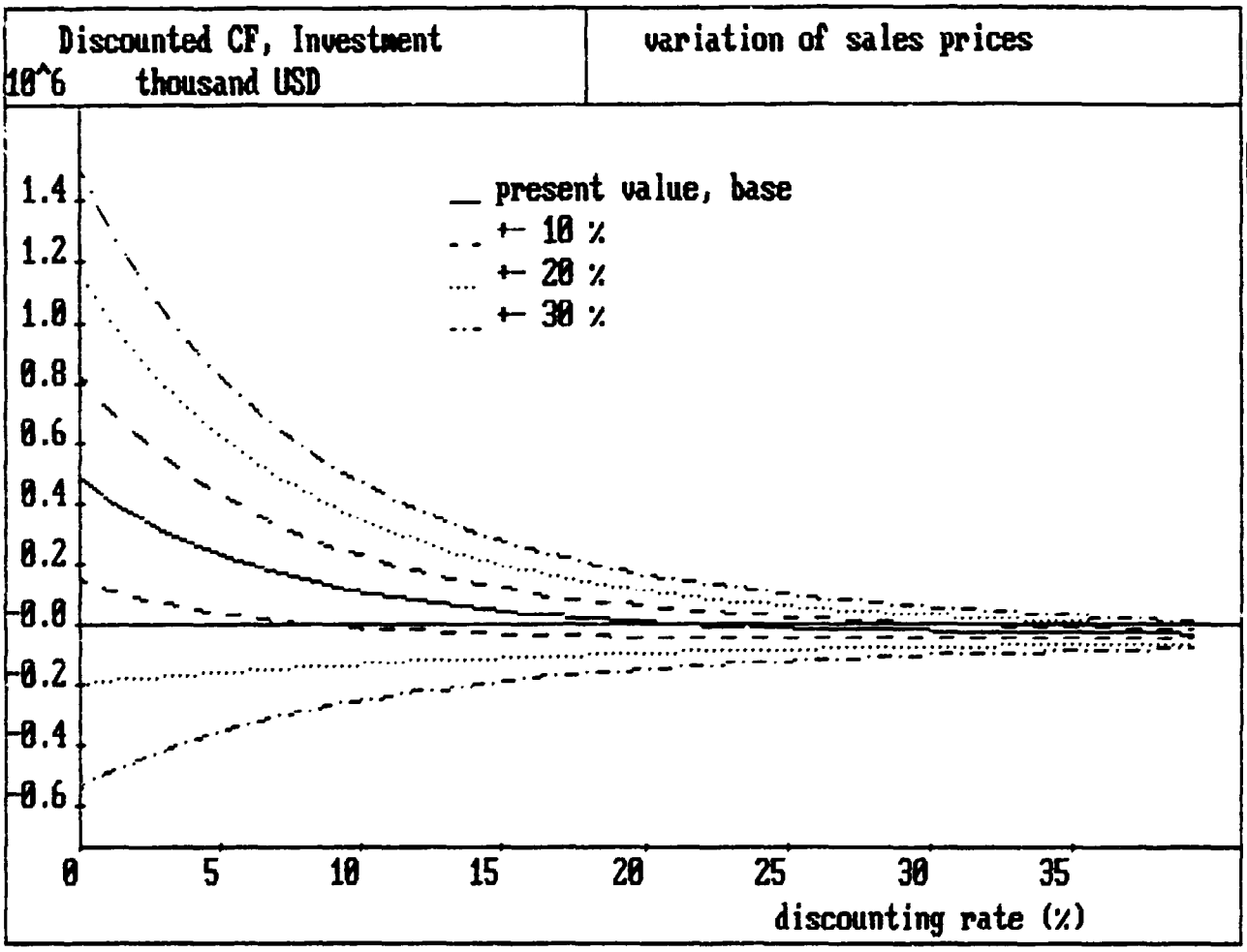

Debt Service Ratio, by year
net cashflow/debt service
variation of the net cashflow
6.0
4.0
2.0
0.0
-2.0
-4.0
base case
+- 10 %
+- 20 %
+- 30 %
+- 40 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Discounted CF, Investment
10^5 thousand USD
4.0
3.0
2.0
1.0
0.0
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

COMFA 2.1 UNIC

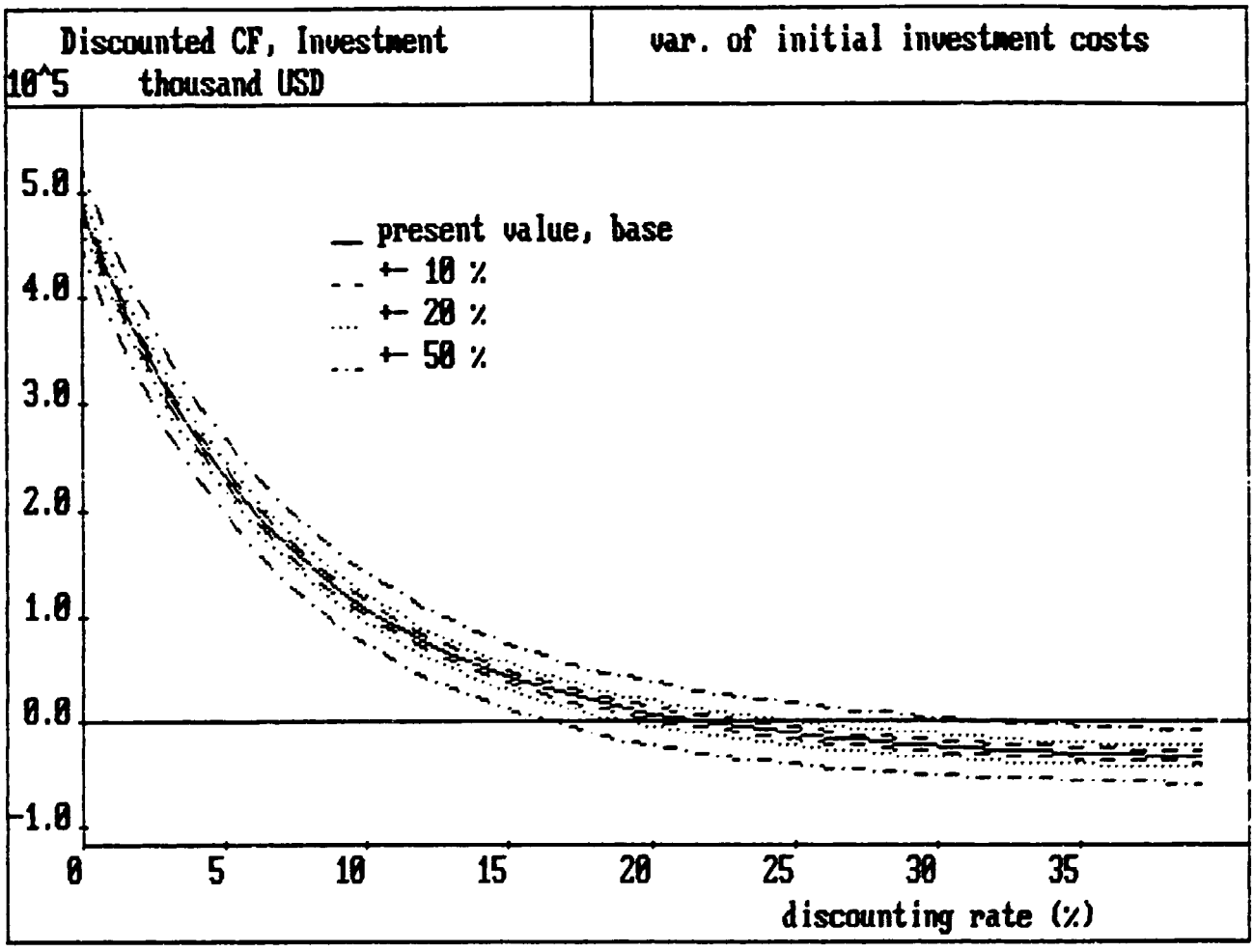


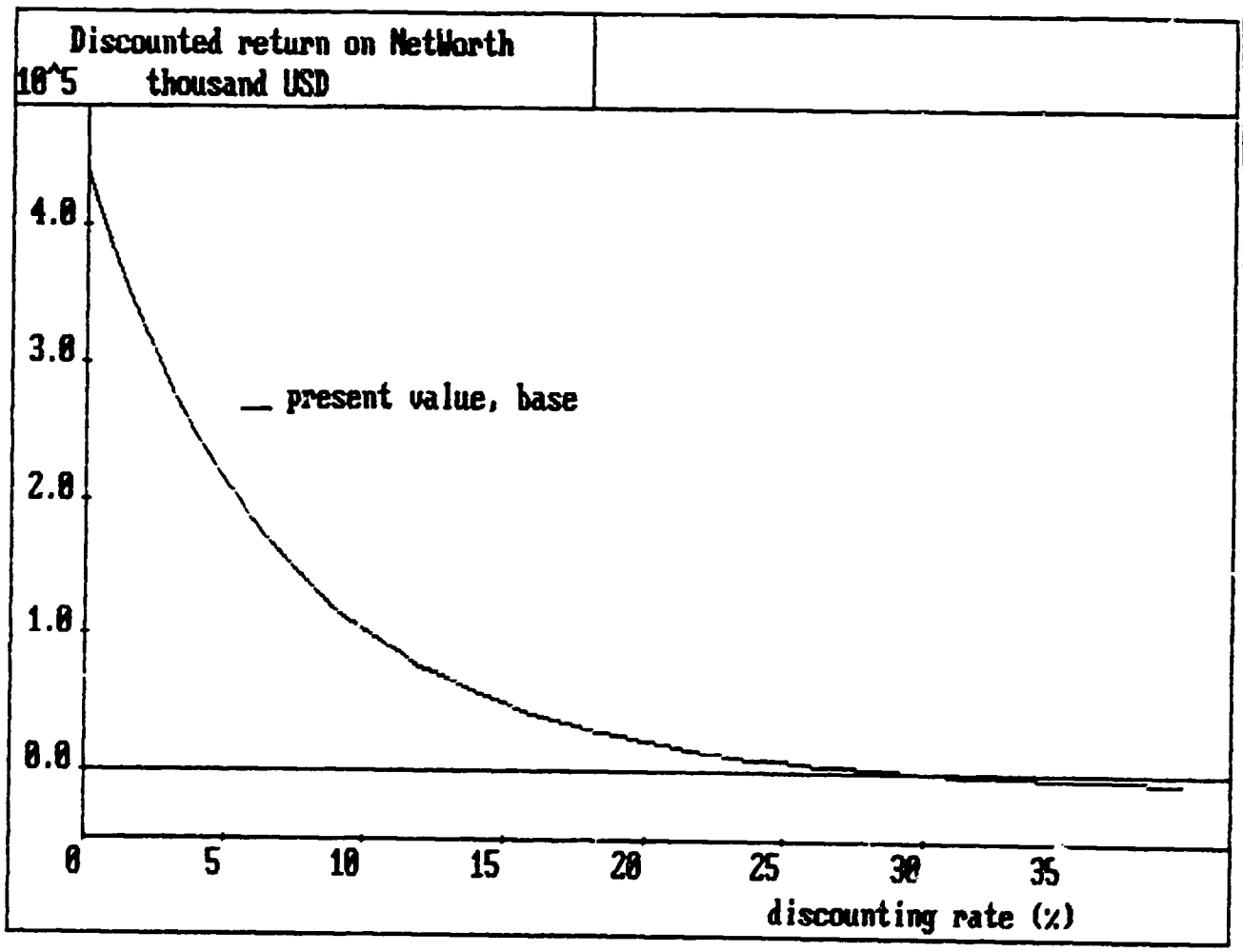

COMFA
2.1 UNI


Discounted CF, Investment
10^6 thousand USD
variation of sales prices
present value, base
+ 10 %
+ 20 %
+ 30 %
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-0.0
-0.2
-0.4
-0.6
0
5
10
15
20
25
30
35
discounting rate (%)

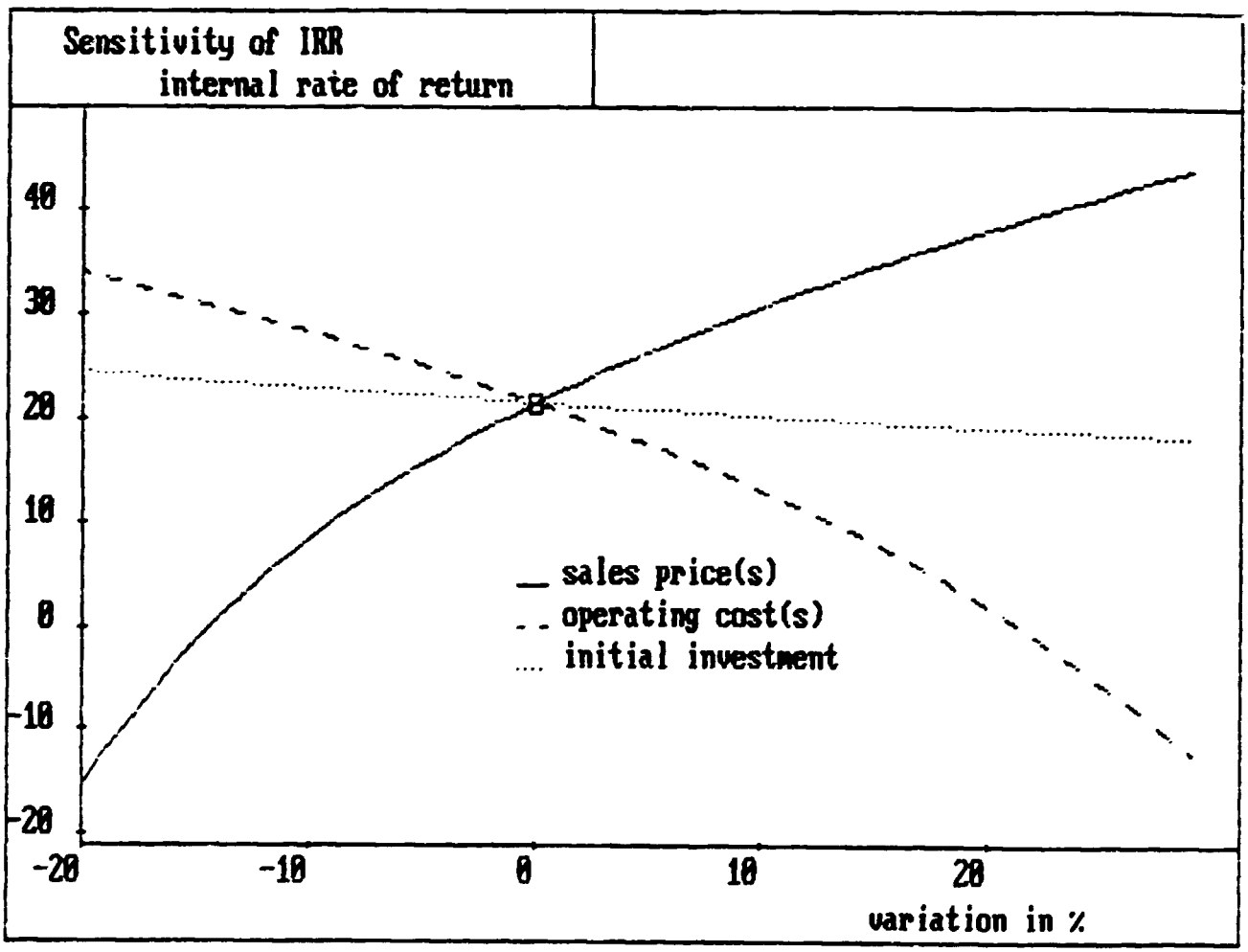
COMFA

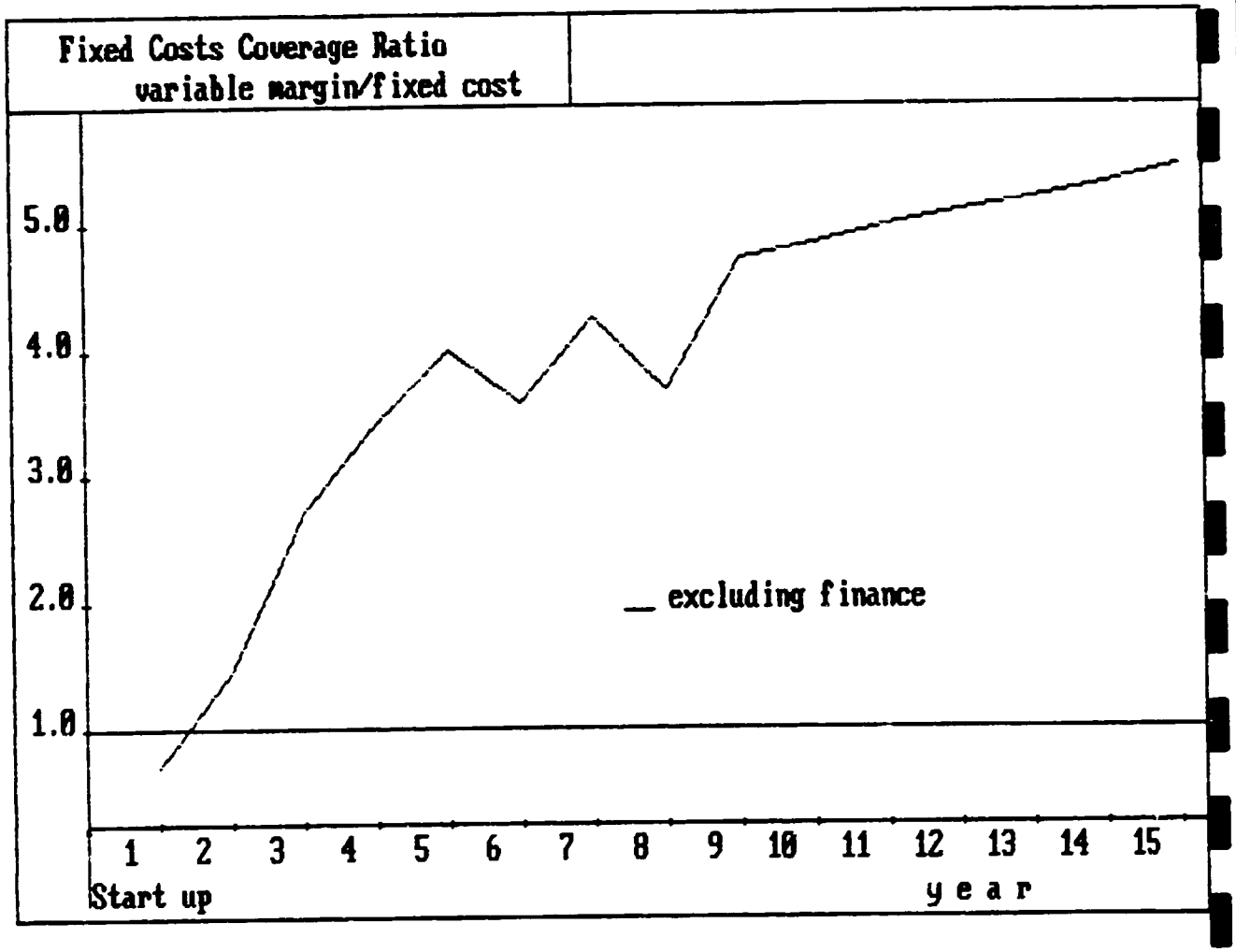
COMFAR 2.1 - POLITECHNA CO.LTD., PRAGUE, CZECHOSLOVAKIA

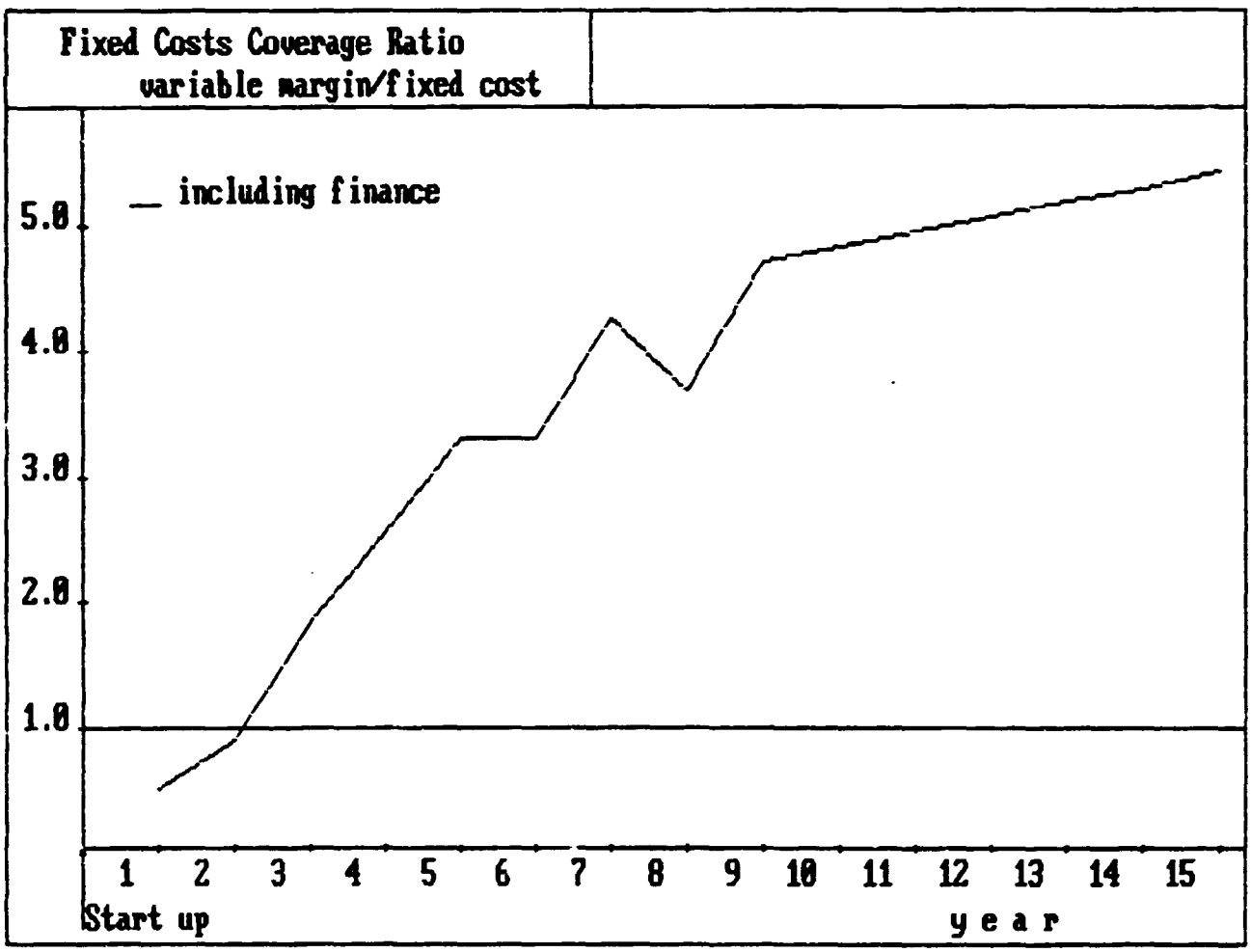


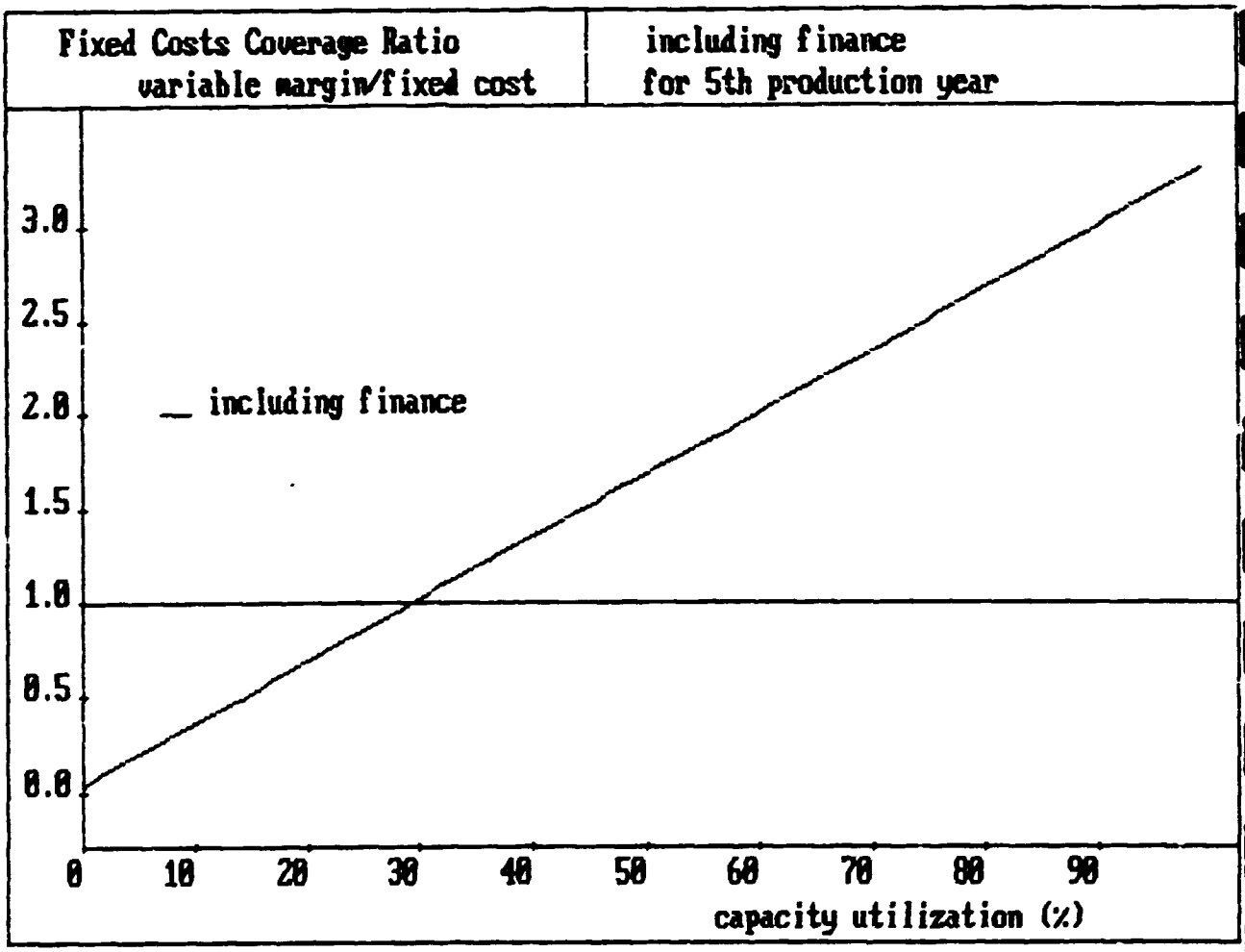

Discounted return on NetWorth
10^5 thousand USD
4.0
3.0
2.0
1.0
0.0
present value, base
0
5
10
15
20
25
30
35
discounting rate (%)

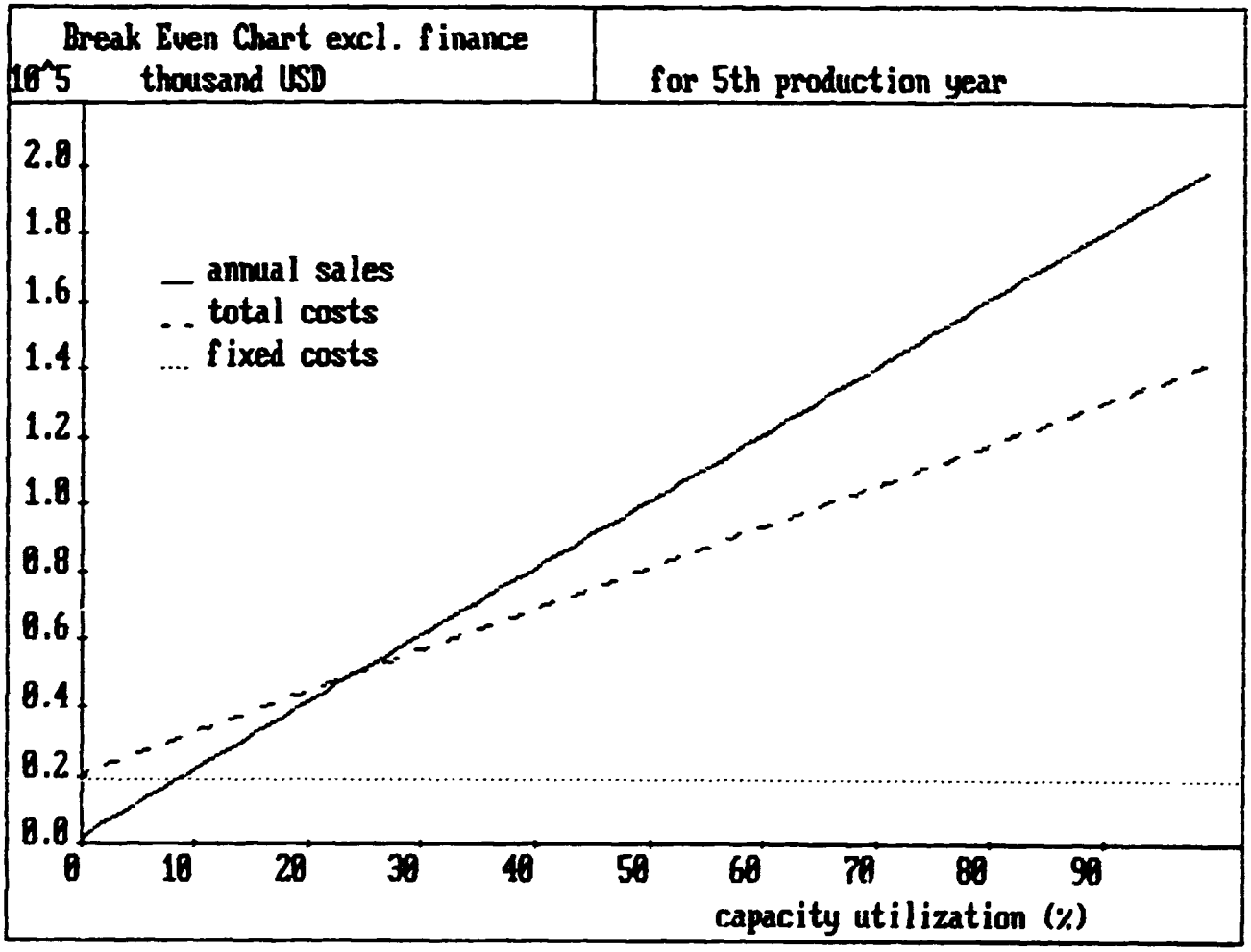
COMFA
2.1 UNI

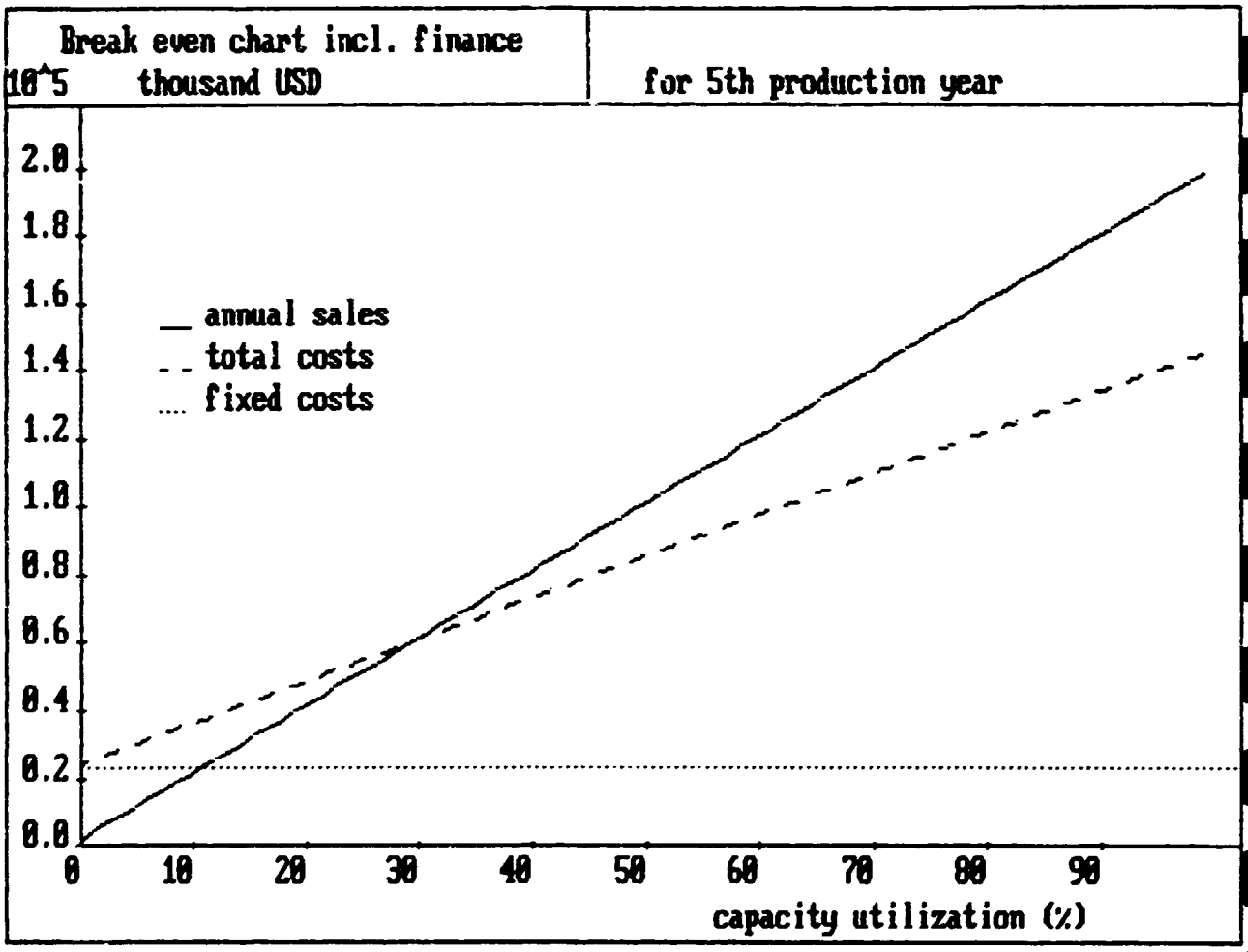

Sensitivity of IRR
internal rate of return
40
30
20
10
0
-10
-20
-20
-10
0
10
20
variation in %
sales price(s)
operating cost(s)
initial investment

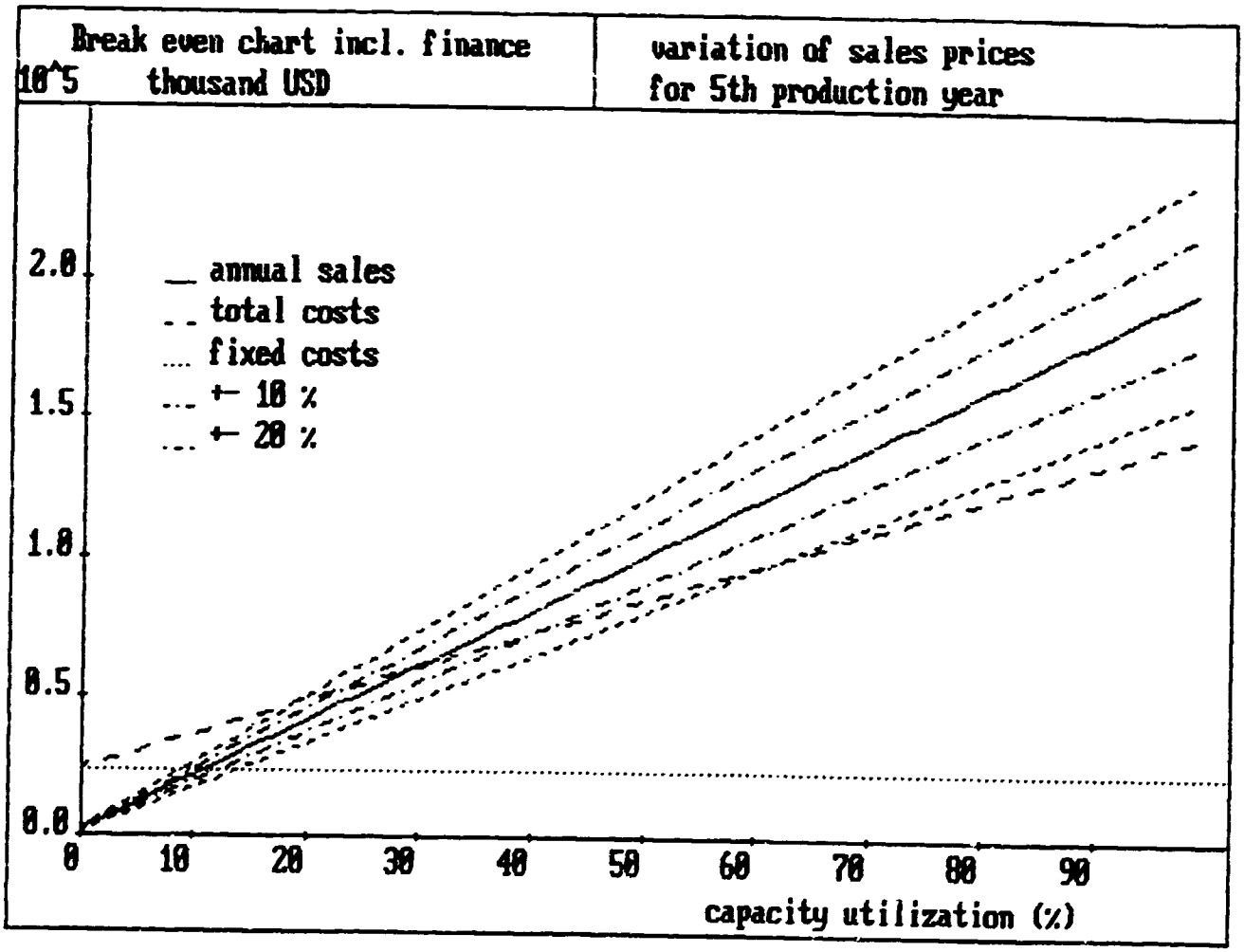


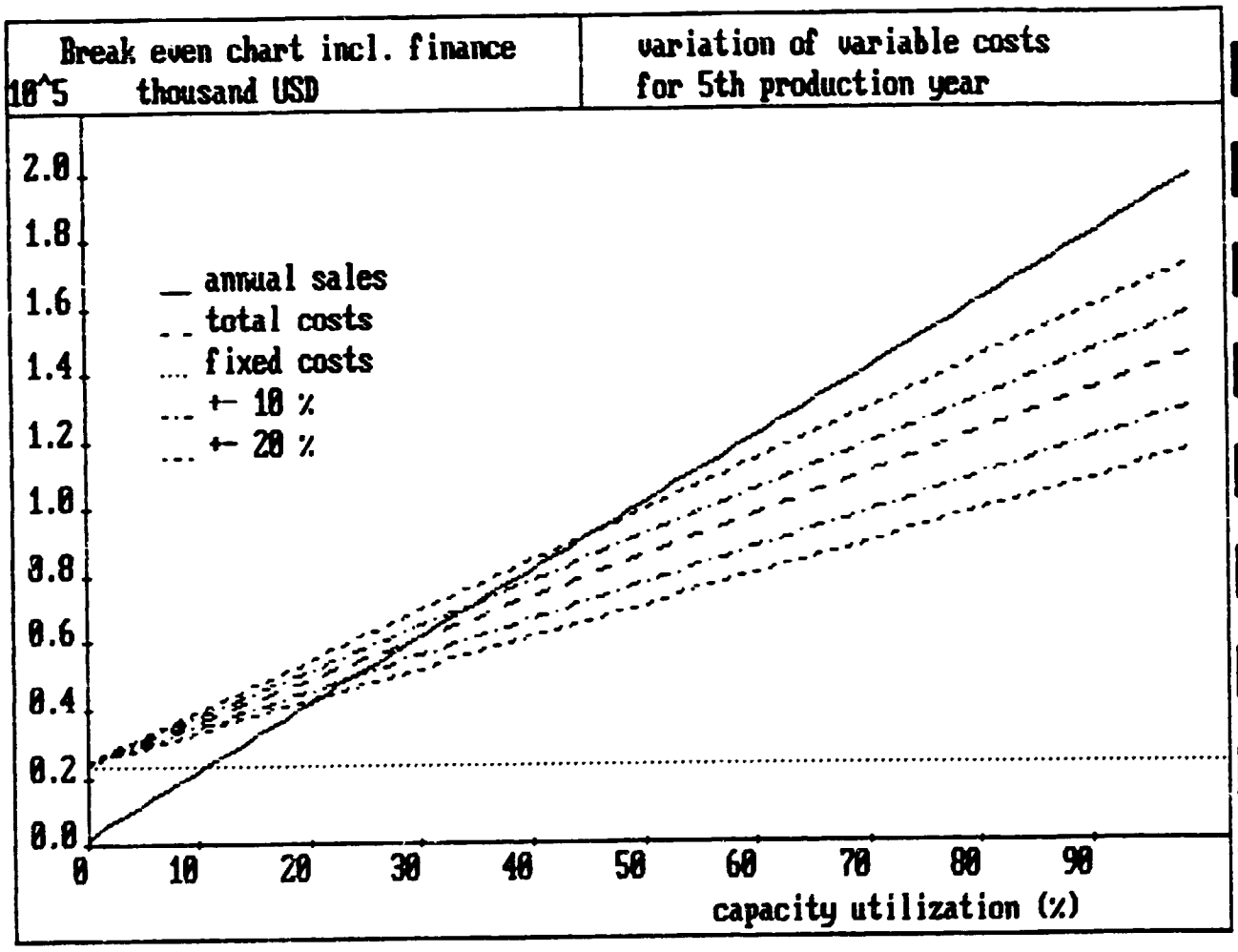

Fixed Costs Coverage Ratio
variable margin/fixed cost
— including finance
5.0
4.0
3.0
2.0
1.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Fixed Costs Coverage Ratio
variable margin/fixed cost
including finance
for 5th production year
3.0
2.5
2.0
1.5
1.0
0.5
0.0
including finance
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break Even Chart excl. finance
10^5 thousand USD
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break even chart incl. finance
10^5 thousand USD
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)


Break even chart incl. finance
10^5 thousand USD
variation of sales prices
for 5th production year
2.0
1.5
1.0
0.5
0.0
annual sales
total costs
fixed costs
+- 10 %
+- 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

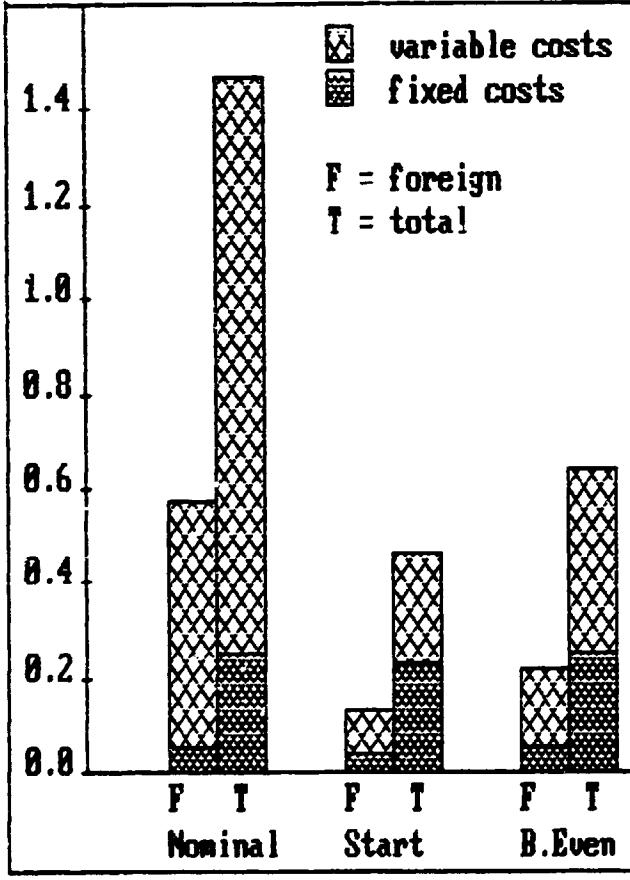

Break even chart incl. finance
10^5 thousand USD
variation of variable costs
for 5th production year
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
annual sales
total costs
fixed costs
← 10 %
← 20 %
0
10
20
30
40
50
60
70
80
90
capacity utilization (%)

COMFA 2.1 UNIC

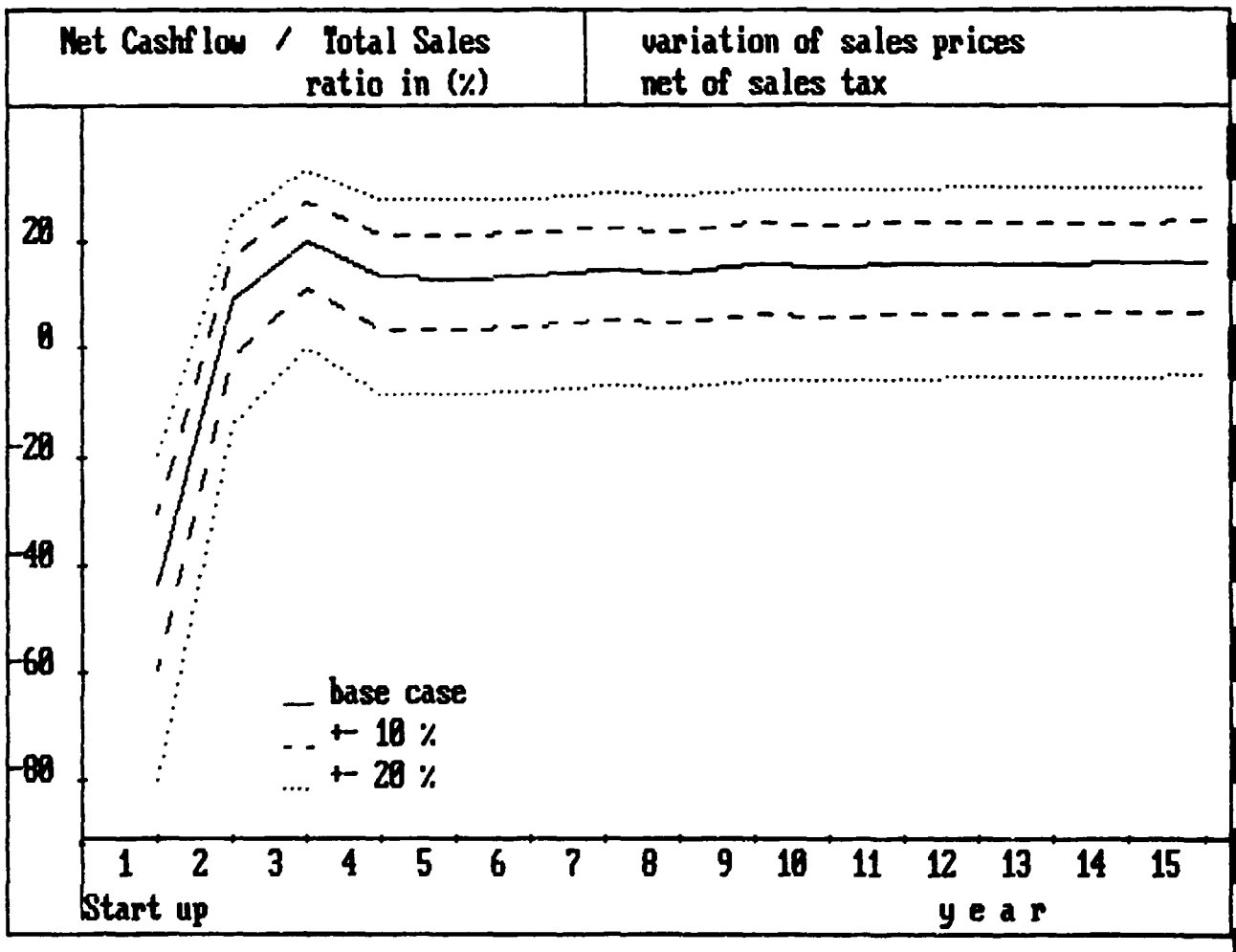
Structure of Production Costs

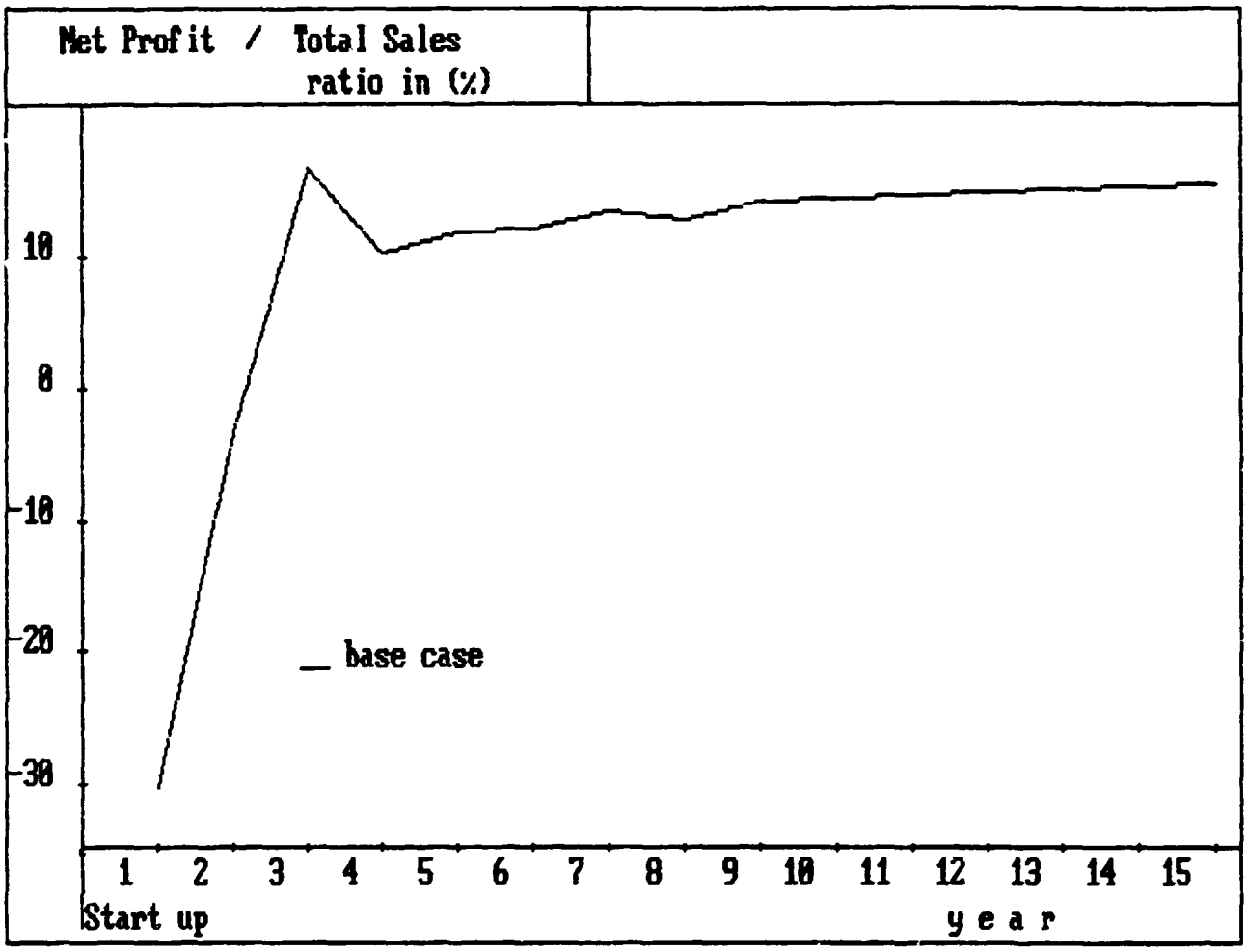
10^5 thousand USD

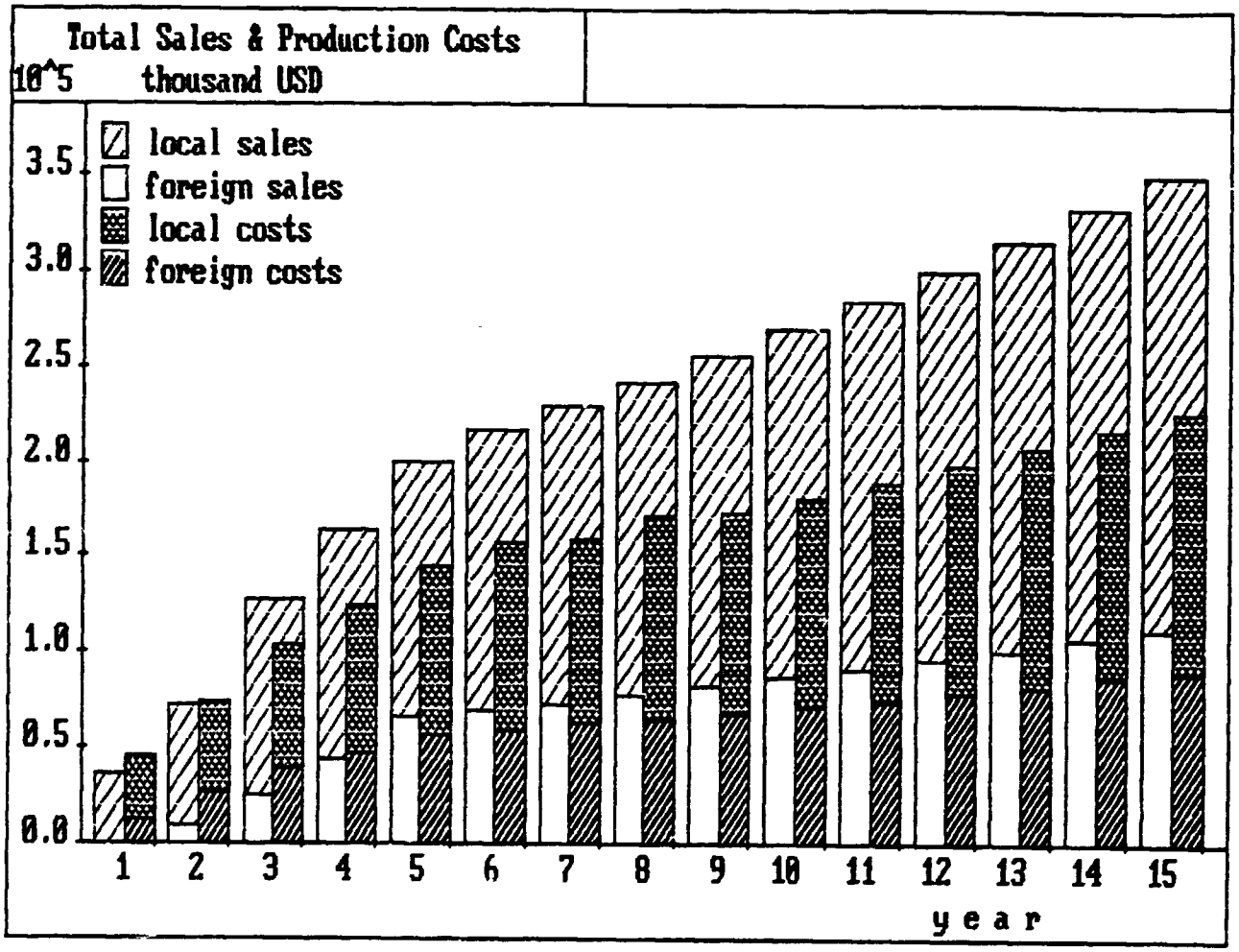
for 5th production year



Nominal	Start up	
72.95	43.22	raw material
6.91	4.98	other RM
3.19	4.51	utilities
0.15	0.21	energy
0.97	3.59	labour
1.19	2.63	maintenance
0.62	0.69	spares
8.30	18.94	overheads
2.98	9.03	depreciation
2.73	12.20	interest
100.00	100.00	Total Prod C.


Net Cashflow / Total Sales ratio in (%)
variation of sales prices net of sales tax
20
0
-20
-40
-60
-80
base case
+- 10 %
+- 20 %
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
Start up
year


Net Profit / Total Sales
ratio in (%)
10
0
-10
-20
-30
base case
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Start up
year


Total Sales & Production Costs
10^5 thousand USD
local sales
foreign sales
local costs
foreign costs
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
year