SKATT PÅ BOLAGSKAPITAL

Sverige i jämförelse med

Storbritannien, USA och Västtyskland

av
Jan Södersten
Thomas Lindberg

IUI INDUSTRIENS UTREDNINGSINSTITUT

INDUSTRIENS UTREDNINGSINSTITUT

Jan Södersten
Thomas Lindberg

SKATT PÅ BOLAGSKAPITAL

Sverige i jämförelse med Storbritannien, USA och Västtyskland

Förord

I slutet av 1979 inbjöds IUI av den amerikanska forskningsorganisationen National Bureau of Economic Research (NBER) att delta i en jämförande studie av kapitalbeskattningen i Storbritannien, Sverige, USA och Västtyskland. Studien påbörjades våren 1980 med deltagande av skatteforskare från Princeton University, University of Birmingham, IFO-Institut, München och IUI och avslutades sommaren 1982. En slutrapport från undersökningen kommer att publiceras i början av 1984 av University of Chicago Press för NBER, IFO-Institut och IUI.*

Med föreliggande forskningsrapport ges svenskspråkiga läsare möjlighet att snabbare ta del av det svenska bidraget till detta forskningsprojekt. Skriften har utarbetats av docent Jan Södersten och civilekonom Thomas Lindberg. Arbetet har letts av Södersten, som också skrivit del I och sektion 1, 2 och 4 i del II. Lindberg har stått för merparten av det statistiska arbetet samt skrivit sektion 3 i del II.

Manuskriptet till utredningen har på sedvanligt sätt seminariebehandlats inom IUI. Också utanför IUI har ett flertal personer lämnat värdefull hjälp. Institutet vill särskilt tacka Villy Bergström, Göran Normann, Göran Råbäck och Rolf Rundfelt. Råd och synpunkter har också lämnats av Ragnar Bentzel, Christer Herzen, Sven-Olof Lodin, Gustav Sandström och Leif Sundberg.

Det är institutets förhoppning att det forskningsarbete som härmed dokumenteras dels skall ge ett värdefullt underlag för den pågående ekonomisk-politiska debatten om skattesystemets utformning, dels kunna utnyttjas för fortsatt forskningsarbete om skatternas betydelse för sparande och kapitalbildning.

Stockholm i maj 1983

Gunnar Eliasson

Innehåll

Tabeller

Forskningsrapportens bakgrund och innehåll

Denna forskningsrapport handlar om hur skattesystemet påverkar betingelserna för investeringar i realkapital inom företagssektorn. Beskattningen är bara en av de faktorer som bestämmer omfattning och inriktning av sparande och kapitalbildning. Våra kunskaper om skatternas relativa betydelse är dessutom mycket begränsade. Men skattesystemets utformning framhålls ofta i debatten som ett hinder för industriell kapitalbildning och eftersom beskattningen är en faktor som direkt kontrolleras av statsmakterna har det stort intresse att närmare utreda hur skatterna påverkar incitamenten att spara och investera.

Forskningsrapporten innehåller två huvuddelar. I *del I* presenteras en metod att mäta den effektiva marginalskatten vid investeringar i realkapital inom företagssektorn, och vidare redovisas jämförbara beräkningar av effektiva marginalskatter för Västtyskland, Storbritannien, Sverige och USA. Dessa beräkningar har utförts inom ramen för ett nyligen avslutat internationellt forskningsprojekt, som syftat till att jämföra beskattningen av kapitalinkomster i dessa fyra länder. Det svenska bidraget till slutrapporten från detta forskningsprojekt utgör *del II* av denna skrift. Denna andra del, som är skriven på engelska, är i sin tur disponerad i fyra sektioner. I den första av dessa återfinns en översiktlig redogörelse för skatteutvecklingen i Sverige under efterkrigstiden. I sektion 2 redovisas de svenska reglerna för beskattning av kapitalinkomster. Framställningen är analytiskt inriktad och syftar till att tolka skattereglerna i termer av den beräkningsmodell som presenterades i del I. Sektionen täcker samtliga de skatter som bestämmer avkastningen efter skatt från realinvesteringar inom företagssektorn och beaktar tre kategorier av ägare och långivare till företagen, nämligen hushåll, skattebefriade institutioner och försäkringsbolag. Frågan vilken relativ betydelse dessa kategorier haft som ägare till företagens aktiekapital och låneskulder studeras i sektion 3. I denna sektion redovisas också en undersökning av hur företagens finansiering fördelar sig mellan lån, nyemission och behållen vinst och av realinvesteringarnas fördelning mellan byggnader, maskiner och lager.

Med hjälp av kalkylmodellen från *del I* och den information som ges i sektion 2 och 3 i *del II* är det sedan möjligt att beräkna den effektiva marginalskatt som gäller vid investeringar i realkapital i företagssektorn. Resultaten av dessa beräkningar presenteras i sektion 4. Beräkningarna gäller i första hand de skatteregler som var i kraft 1980, men som jämförelse har motsvarande skattekalkyler utförts också med beaktande av de reformer av den personliga inkomstbeskattningen som beslutades i juni 1982. Arbetet

9

med *del II* i denna skrift avslutades sommaren 1982 och i denna del har vi därför inte kunnat beakta de förändringar i bl a företagsbeskattningen som aviserades av regeringen hösten 1982 och våren 1983. Vissa effekter av nya skatteregler redovisas dock i ett särskilt avsnitt (avsnitt E) i *del I*.

DEL I

SYFTE OCH METOD

A. Undersökningens problem

Beskattningen av kapitalavkastningen i företagssektorn påverkar förutsättningarna för en investering på bl a två viktiga sätt. För det första är beskattningen en viktig faktor i bestämningen av företagens interna finansieringsutrymme. För det andra styr den i hög grad kapitalkostnaden för det marginella investeringsobjektet och därmed lönsamheten av en investering. Det är främst denna sistnämnda aspekt på beskattningens verkningar som behandlas i denna bok, som syftar till att belysa hur det svenska skattesystemet påverkar incitamenten att spara och investera.

I debatten om skattesystemets verkningar redovisas ibland beräkningar av hur stor del av företagens vinster som faktiskt betalas i skatt i olika led av företagen och deras ägare. Sådana beräkningar belyser beskattningens finansieringskonsekvenser. För att bedöma hur skattesystemet inverkar på lönsamheten av en investeringsökning är det emellertid den *marginella* skattebelastningen som är av intresse och denna kan inte direkt observeras. Den marginella skattebelastningen kan emellertid teoretiskt beräknas med hjälp av konventionella investeringskalkyler. Sådana kalkyler gör det möjligt att beräkna storleken av den "kil" skattesystemet skjuter in mellan avkastningen före skatt på marginella investeringsobjekt och den avkastning efter skatt företagens ägare och långivare får på det sparande som erfordras för investeringarnas finansiering. Den effektiva marginalskatten anger helt enkelt hur mycket procentuellt lägre avkastningen efter skatt i finansiärernas händer är jämfört med avkastningen före skatt på investeringsobjekten.

Syftet med denna studie är alltså att beräkna den marginella skattebelastningen vid investeringar i realkapital inom den privatägda delen av företagssektorn. Detta är en komplicerad uppgift som bl a kräver ett hänsynstagande till flera olika skatter. Det gäller bl a bolagsskatten med dess olika värderings- och avsättningsregler och finansiärernas beskattning av ränteinkomster, utdelningar, kapitalvinster och förmögenhet. Kalkylerna måste alltså beakta vilken typ av realkapital företagen investerar i, hur investeringarna finansieras, vilka som är ägare och långivare till företagen och inom vilka näringsgrenar investeringarna genomförs.

Låt p beteckna den reala avkastningen efter ekonomiskt korrekta avskrivningar men före skatt på marginella investeringsobjekt och s motsvarande reala avkastning efter skatt för finansiärerna. Den marginella skattesatsen t kan då tecknas

$$t = \frac{p-s}{p}$$

Rent praktiskt kan marginalskattesatsen bestämmas på olika sätt. Vi utgår här i allmänhet från att investeringsobjekten ger en realavkastning på 10 procent före skatt ($p = 0{,}1$) och beräknar den maximala avkastning efter skatt, s, företaget då kan lämna sina finansiärer. Vi särskiljer för dessa beräkningar tre typer av realkapital (maskiner, byggnader och lager) inom tre näringsgrenar (tillverkningsindustri, övrig industri och handel), tre finansieringskällor (lån, nyemission och kvarhållen vinst) och tre kategorier av ägare och långivare till företagen (hushåll, skattebefriade institutioner och försäkringsbolag). Sammanlagt innebär detta att "kilen" mellan avkastningen före och efter skatt beräknas för hela 81 (3·3·3·3) kombinationer av en tänkt marginell investering.

Nästa steg i kalkylarbetet är att väga samman "skattekilarna" för de 81 kombinationerna och beräkna marginella skattesatser för olika slag av genomsnittliga investeringar. Som vikter för denna sammanvägning utnyttjas särskilda kartläggningar av hur investeringarna i verkligheten är fördelade mellan de tre näringsgrenarna och mellan maskiner, byggnader och lager, liksom av det faktiska finansieringsmönstret och av den relativa betydelsen av hushåll, skattebefriade institutioner och försäkringsbolag som ägare och långivare till företagen. Den marginella skattesatsen för t ex hushållen säger då helt enkelt hur mycket procentuellt lägre avkastningen efter skatt är jämfört med avkastningen före skatt, med hänsyn tagen till investeringarnas faktiska fördelning över kapitaltyp och näringsgrenar och till existerande finansieringsmönster. Alternativt uttryckt mäter den marginella skattesatsen summan av de skatter som tas ut i olika led på avkastningen från en marginell ökning av kapitalstocken i de tre näringsgrenarna, givet att det för kapitaltillväxten erforderliga sparandet kanaliseras till företagen i former som svarar mot existerande finansieringsmönster.

B. Den allmänna kalkylmodellen

I detta avsnitt presenteras den kalkylmodell som utnyttjas för att beräkna storleken av den "kil" skattesystemet slår in mellan avkastningen före och efter skatt. De modifikationer av denna allmänna modell som krävs för vissa speciella inslag i det svenska skattesystemet, såsom det s k Annell-avdraget vid nyemission och investeringsfondssystemet, redovisas i den engelskspråkiga del II av denna bok. Framställningen i detta avsnitt är tekniskt inriktad. Läsare som i huvudsak är intresserade av undersökningens resultat kan därför direkt fortsätta till avsnitt C som innehåller en kortfattad jämförelse av marginell skattebelastning i Storbritannien, Sverige, Tyskland och USA.

Låt oss för modellresonemanget utgå från en företagsinvestering vars anskaffningskostnad är 1 kr. Vi antar att alla skatteregler som påverkar avkastningen från investeringen är kända och oförändrade över tiden. Det råder full säkerhet om framtiden och alla priser stiger i en konstant takt. Den beskattningsbara vinsten från investeringen beräknas med hänsyn till följande tre regler:

(i)   Företaget får utnyttja andelen f_1 av anskaffningskostnaden för reguljära skattemässiga avskrivningar, vilka utgår med procentsatsen a, räknat på resterande bokfört värde. Genom avskrivningarna minskar företagets skattebetalningar och vi låter $f_1 A_D$ beteckna nuvärdet av dessa skattereduktioner. Det gäller då att

$$A_D = \int_0^\infty \tau a e^{-au-\varrho u} du$$

där u betecknar tiden, τ är bolagsskattesatsen och ϱ företagets nominella diskonteringsränta. Vi förutsätter här (och i det följande) att företagets vinster är tillräckliga för att utnyttja maximalt tillåtna avskrivningar.

(ii) Utöver de reguljära skatteavskrivningarna har företaget rätt att redan vid anskaffningstillfället skriva av andelen f_2 av investeringskostnaden. Genom denna omedelbara avskrivning minskar företagets skatt med beloppet τf_2.

(iii) Statsmakterna ger företaget en investeringssubvention som utgår med procentsatsen g räknat på andelen f_3 av investeringskostnaden. Subventionen per investerad krona är alltså $f_3 g$.

15

Med hänsyn till reglerna (i)–(iii) blir företagets nettokostnad, C, för en investering, vars anskaffningskostnad är 1 kr

$$C = 1 - A \tag{1}$$

där $A = f_1 A_D + f_2 \tau + f_3 g$

Antag nu att investeringen ger en bruttoavkastning som är MRR (gross *m*arginal *r*ate of *r*eturn). Om kapitalföremålet deprecierar i takten δ och inflationstakten är π, blir bruttovinsten från investeringen i tidpunkt u därmed $MRRe^{-\delta u + \pi u}$. Nuvärdet av alla framtida bruttovinster från investeringsprojektet, netto efter skatt (men före skattemässiga avskrivningar etc), kan då tecknas

$$V = \int_0^\infty (1-\tau) \, MRRe^{-\delta u + \pi u - \varrho u} du \tag{2}$$

Investeringen är värd att genomföra då

$$V \geqslant 1 - A \tag{3}$$

dvs då nuvärdet av bruttovinsterna, efter skatt, minst motsvarar nettokostnaden för investeringen.

För en given diskonteringsränta ϱ kan man med hjälp av ekvation (3) bestämma den lägsta bruttoavkastning, MRR_{min}, investeringen måste ge för att den skall vara värd att genomföra ($V = 1 - A$). Vi får att

$$MRR_{min} = \left(\frac{1-A}{1-\tau} \right) (\delta + \varrho - \pi) \tag{4}$$

Genom att minska bruttoavkastningen, MRR_{min}, med den ekonomiska avskrivningen, δ, fås slutligen den lägsta nettoavkastning eller räntabilitet före skatt, p, företaget kan acceptera för en marginell investering:

$$p = \left(\frac{1-A}{1-\tau} \right) (\delta + \varrho - \pi) - \delta \tag{5}$$

Ekvation (5) uttrycker i allmän form företagets räntabilitetskrav före skatt vid realinvesteringar. Detta räntabilitetskrav varierar mellan maskiner och byggnader, eftersom maskiner och byggnader dels deprecierar i olika takt (δ), dels i skattehänseende får skrivas av olika snabbt så att nettokostnaden, $1 - A$, blir olika.

Med en enkel modifikation är uttrycket (5) giltigt också för lagerinvesteringar, som ju representerar specialfallet $\delta = 0$. Då lagervärderingen grundas på den s k FIFO-principen (först in – först ut) gäller att nominella prisstegringsvinster är beskattningsbara för företaget. Vid en lagerinvestering för 1 kr är prisvinsten π och genom denna prisvinst ökar företagets skattebetalningar därför med $\tau\pi$ i varje period. En generalisering av

16

uttrycket (2) för att ta hänsyn till att nominella prisvinster på kapitalinvesteringar kan vara beskattningsbar inkomst blir därför

$$V = \int_0^\infty [(1-\tau) \, MRR - v\tau\pi] \, e^{-\delta u + \pi u - \varrho u} du$$

För lagerinvesteringar som värderas enligt FIFO-principen är $v = 1$, medan för maskiner och byggnader $v = 0$. Uttrycket ger

$$p = \frac{1}{1-\tau}[(1-A)(\delta + \varrho - \pi) + v\tau\pi] - \delta$$

Förräntningskravet före skatt, p, bestäms slutligen också av företagets diskonteringsränta, ϱ, och denna beror i allmänhet dels av den nominella marknadsräntan, i, dels av vilken finansieringskälla företaget utnyttjar för sina marginella investeringsobjekt. Vid lånefinansiering gäller helt enkelt att

$$\varrho = i(1-\tau)$$

därför att ränteinkomster beskattas och läneräntor är avdragsgilla för företaget.

Då den marginella investeringen finansieras med eget kapital i form av kvarhållen vinst eller nyemission bestäms diskonteringsräntan av marknadsräntan, i, och *ägarnas* beskattning. För nyemissionsfinansiering kan man sålunda visa att[1]

$$\varrho = i \left(\frac{1-m}{1-m_d} \right)$$

där m är ägarnas marginella inkomstskattesats och m_d är marginalskatten för utdelningsinkomster. Vid finansiering med behållna vinstmedel gäller att

$$\varrho = i \left(\frac{1-m}{1-z} \right)$$

där z är den effektiva marginalskatten för kapitalvinster på aktier.[2]

De angivna uttrycken för företagets diskonteringsränta, ϱ, förutsätter att marknadsräntan, i, bestäms på en fri och väl fungerande kapitalmarknad. Med denna utgångspunkt uttrycker marknadsräntan just den *alternativa* avkastningsmöjlighet som bestämmer kapitalägarnas förräntningsanspråk vid finansiella investeringar i aktier. Då nominella ränteinkomster beskattas som inkomst i ägarnas händer, kan vi därför teckna finansiärernas reala avkastning efter skatt:

$$s = i(1-m) - \pi - w_p \tag{6}$$

där m är marginalskatten (för respektive ägarkategori) och w_p är den marginella förmögenhetsskatten (gäller endast hushållen).

17

Kalkylernas uppläggning och innebörd

Med hjälp av uttrycken (5) och (6) är det alltså möjligt att beräkna storleken av den "kil" skattesystemet slår in mellan avkastningen före skatt på ett marginellt investeringsobjekt och avkastningen efter skatt på det sparande som erfordras för investeringarnas finansiering. Genom att sätta "skattekilen", $p - s$, i relation till avkastningen före skatt, får vi den effektiva marginalskatten

$$t = \frac{p-s}{p}$$

Skattesatsen t mäter alltså hur stor del av företagets räntabilitetskrav som hänför sig till skatteskyldigheten i olika led och inte till finansiärernas avkastning, netto efter skatt.

Mätningarna av den effektiva marginalskatten, t, kan räknetekniskt läggas upp på olika sätt. Man kan utgå från en viss marknadsränta, i, och med hjälp av uttrycken (5) och (6) räkna fram både företagets räntabilitetskrav, p, och spararnas ersättning efter skatt, s. Alternativt kan man utifrån en given avkastning före skatt på företagets investeringar, p, med hjälp av ekvationen (5) och de redovisade sambanden mellan företagets diskonteringsränta, ϱ, och marknadsräntan, i, beräkna den maximala avkastning efter skatt, s, företaget kan lämna sina finansiärer. Som framgått är det denna senare uppläggning av kalkylerna (under benämningen "fixed-p" case) som använts i de flesta av de beräkningar av marginell skattebelastning som kommer att redovisas i denna bok. Avkastningen före skatt på företagets marginella investeringar har därvid satts till 10 procent ($p = 0,1$).[3]

I nästa avsnitt kommer vi att presentera olika beräkningar av effektiv marginell skattebelastning för Storbritannien, Västtyskland, Sverige och USA. För att underlätta tolkningen av dessa beräkningar skall vi avsluta det teoretiska modellresonemanget i detta avsnitt med att visa hur olika alternativ för skattereglernas utformning påverkar företagets förräntningskrav före skatt, p, och ägarnas avkastning efter skatt, s.

Låt oss som utgångspunkt ta ett renodlat fall, som bygger på följande förutsättningar. Bolagsbeskattningen antas vara så utformad att de skattemässiga avskrivningarna motsvarar realkapitalets åldrande och förslitning (vilket innebär att de görs med procentsatsen δ, räknat på det nedskrivna återanskaffningsvärdet). Nominella prisvinster på realkapitalet utgör vidare beskattningsbar vinst för företaget. Förutsatt att inga ytterligare bidrag eller avsättningsmöjligheter existerar, innebär detta formellt att (se ekv (1) ovan) $f_1 = 1$, $a = \delta - \pi$, $f_2 = f_3 = 0$. Vi får då att

$$A = \frac{\tau(\delta-\pi)}{\delta+\varrho-\pi} \tag{7}$$

vilket betyder att (vid insättning av (7) i (5)) företagets räntabilitetskrav före skatt förenklas till:

$$p = (\frac{\varrho}{1-\tau}) - \pi \qquad (8)$$

Vid *lånefinansiering* är, som framgått, företagets diskonteringsränta, ϱ, helt enkelt marknadsräntan efter skatt, dvs. $i(1-\tau)$. Det innebär i sin tur att:

$$p = i - \pi \qquad (9)$$

I detta renodlade fall med lånefinansiering är alltså bolagsbeskattningen *neutral* i den meningen att förräntningskravet p är oberoende av variationer i bolagsskattesatsen τ. Detta resultat betyder i sin tur, att om lagstiftningen ger möjlighet till avskrivningar, investeringsbidrag etc som sammanlagt är förmånligare än den norm som definieras av uttryck (7), så kommer företagsbeskattningen i själva verket att *subventionera* lånefinansierade investeringar.

Fri avskrivning representerar ett viktigt exempel på en sådan acceleration av de skattemässiga avskrivningarna. Formellt innebär fri avskrivning att $f_2 = 1$ och $f_1 = f_3 = 0$ i ekvation (1) och att därför $A = \tau$. Det gäller då att:

$$p = i(1-\tau) - \pi \qquad (10)$$

Företagets förräntningskrav före skatt blir alltså lägre ju högre bolagsskattesatsen är. Genom att utnyttja ekvation (6), kan vi för detta specialfall skriva den effektiva marginalskatten:

$$t = \frac{p-s}{p} = \frac{i(m-\tau) + w_p}{i(1-\tau) - \pi} \qquad (11)$$

Det framgår omedelbart av uttrycket (11) att den marginella skattesatsen kan vara *negativ*. Om vi bortser från den marginella förmögenhetsskatten w_p (som för hushållen uppgår till 0,6 %), är ett tillräckligt villkor för detta att $m < \tau$, dvs att ägarnas marginalskatt är lägre än bolagsskattesatsen. Då $m < \tau$ gäller att den subventionering av lånefinansierade investeringar, som bolagsskatten erbjuder genom fri avskrivning, mer än väl uppväger beskattningen av ränteinkomster i ägarnas händer.

Vid finansiering med *kvarhållna vinster* är företagets diskonteringsränta $\varrho = i(1-m)/(1-z)$ och vid fri avskrivning ($f_2 = 1$, $f_1 = f_3 = 0$, $A = \tau$) blir företagets räntabilitetskrav före skatt därför:

$$p = i (\frac{1-m}{1-z}) - \pi \qquad (12)$$

medan motsvarande uttryck vid *nyemission* är

$$p = i (\frac{1-m}{1-m_d}) - \pi \qquad (13)$$

19

Företagets räntabilitetskrav vid finansiering med eget kapital (kvarhållen vinst eller nyemission) är alltså oberoende av variationer i skattesatsen τ, om skattelagstiftningen medger fri avskrivning (eller avskrivningar, investeringsbidrag etc som sammanlagt innebär att $A = \tau$). Denna skillnad mellan finansieringskällorna lån och eget kapital ifråga om hur avskrivningsreglerna måste utformas för att uppnå skattemässig *neutralitet,* dvs. för att räntabilitetskravet skall vara oberoende av skattesatsen τ, sammanhänger självfallet med den skattemässiga behandlingen av ersättningen till finansiärerna. Kostnaden för det egna kapitalets förräntning utgör till skillnad från låneräntan ingen avdragsgill kostnad för företagen. Genom den fria avskrivningen kompenseras företagen precis för denna begränsning.

Uttrycken (12) och (13) implicerar att företagsbeskattningen *subventionerar* egenfinansierade investeringar endast om lagstiftningen ger företagen möjligheter till avskrivningar, investeringsbidrag etc, som sammanlagt är fördelaktigare än fri avskrivning (vilket betyder att $A > \tau$).

C. Den internationella bilden

I detta avsnitt sammanfattas våra kalkyler av effektiva marginalskatter för Västtyskland, Storbritannien, Sverige och USA,[4] enligt de skatteregler som var i kraft 1980. En starkt förenklad översikt över dessa regler ges i tabell 1.1 (A–D), som anknyter till den i föregående avsnitt presenterade kalkylmodellen. I tabell 1.1 visas också de viktsystem som utnyttjas för att väga samman "skattekilarna" för olika kombinationer av typ av realinvestering, näringsgren, finansieringsform och ägarkategori till en effektiv marginalskatt för olika slag av "genomsnittliga" investeringar. Viktsystemen avspeglar, som nämnts, hur realkapitalstockarna i de fyra länderna faktiskt är fördelade dels mellan tillverkningsindustri, övrig industri och handel, dels mellan maskiner, byggnader och lager. Vidare återspeglar de hur finansieringen är uppdelad på lån, kvarhållen vinst och nyemission och vilken relativ betydelse hushåll, skattebefriade institutioner och försäkringsbolag har som ägare och långivare till företagen.

De effektiva marginalskatter som visas i *tabell 1.2,* gäller för det s k "fixed-p" fallet, vilket innebär att vi utgår från att alla investeringsobjekt ger en real avkastning på 10 procent före skatt. Beräkningarna avser, som framgår, olika kombinationer av "genomsnittliga" investeringar och tar hänsyn till den genomsnittliga prisstegringstakten i respektive land åren 1971–80. Den första raden i tabellen visar sålunda hur hög den effektiva marginalskatten är för en "genomsnittlig" maskininvestering, då hänsyn tas till för det första hur maskininvesteringarna är fördelade mellan tillverkningsindustri, övrig industri och handel, för det andra hur investeringarna finansieras (lån, nyemission eller behållen vinst) och för det tredje hur ägandet till företagens låneskulder och egna kapital fördelar sig mellan hushåll, skattebefriade institutioner och försäkringsbolag. Av raderna 10–12 framgår den effektiva marginalskatten för respektive ägarkategori, med hänsyn till hur företagens finansiering är ordnad och till fördelningen av investeringarna mellan olika typer av realkapital och mellan olika näringsgrenar. I tabellens nedersta rad, slutligen, ges ett sammanfattande mått på den effektiva marginalskatten för respektive land. Denna "totala" marginalskatt visar helt enkelt hur mycket procentuellt lägre avkastningen efter skatt är jämfört med avkastningen före skatt i genomsnitt för de tre kategorierna av ägare, med hänsyn tagen till såväl det faktiska finansieringsmönstret som till investeringsobjektens fördelning mellan näringsgrenarna och mellan de tre typerna av realkapital.

Som framgår uppvisar Tyskland den högsta "totala" marginalskatten med 48 procent, följt av USA med 37 procent, Sverige med 36 procent och

21

Tabell 1.1A Översikt över skattesystemen. Bolagsbeskattningen 1980.

	Sverige	Stor-britannien	Västtyskland	USA
Formell skattesats (procent)[a]	57	52	62	45
Metod för att reducera dubbelbeskattning	Annell-avdrag	Avräknings-system	Avräkningssystem och lägre bolags-skatt för utdelad vinst	Ingen
Lagervärdering[b]	FIFO	LIFO	–	LIFO
Lagernedskrivning (pro-cent)	60	0	0	0
Avskrivningsregler 1. Maskiner[c] (Motsvarande pro-centtal vid avskriv-ning enligt "declining balance" metoden.)	30	100	28	30
2. Byggnader[d] (Motsvarande antal år vid linjär avskrivning)	19	5	30	26
Investeringsbidrag (el. motsv.) i procent av an-skaffningskostnad[e] 1. Maskiner 2. Byggnader	11,4 5,7	6,3 12,1	2,1 2,1	9,6 0,0

Tabell 1.1B Översikt över skattesystemen. Finansiärernas beskattning 1980.

	Sverige	Storbri-tannien	Väst-tyskland	USA
Marginell inkomstskatt 1. Hushåll				
a) Banksparare	49	30	40	28
b) Aktieägare	64	45	48	48
2. Försäkringsbolag[f]				
a) vid obl. placering	29	23	3	41
b) vid aktieplacering	23	18	3	7
Marginell kapitalvinstskatt[g] 1. Hushåll	26	28	0	14
2. Försäkringsbolag	19	18	0	28

Tabell 1.1C Viktsystemen. Kapitalstockens fördelning och finansiering.

Kapitalstockens fördelning / Kapitaltyp	Sverige				Storbritannien				Västtyskland				USA			
	Tillv.	Övr.	Handel	Tot.	Tillv.	Övr.	Handel	Tot.	Tillv.	Övr.	Handel	Tot.	Tillv.	Övr.	Handel	Tot.
1. Maskiner	42,1	13,5	18,4	32,3	49,3	76,9	28,7	46,8	45,1	42,7	21,0	41,7	19,8	31,0	16,6	22,5
2. Byggnader	34,0	35,4	33,2	34,1	28,3	18,8	49,8	33,2	25,5	46,8	48,0	29,8	49,4	63,3	49,8	53,9
3. Lager	23,9	51,1	48,4	33,6	22,4	4,3	21,5	20,0	29,4	10,5	31,0	28,5	30,8	5,7	33,6	23,6
	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Näringsgrenens andel av tot. kapitalstock	62,6	18,7	18,7	100,0	60,4	11,7	27,9	100,0	80,9	5,7	13,4	100,0	43,8	31,1	25,1	100,0
Finansieringsformer[h]																
1. Lån	40,5	81,2	62,5	52,2				19,3	43,5	31,2	49,6	43,6	19,8	48,5	40,0	33,8
2. Nyemission	2,4	0,9	1,8	2,0	–			4,4	4,9	6,0	4,4	4,9	5,9	3,8	4,4	4,9
3. Behållen vinst	57,1	17,9	35,7	45,8				76,3	51,6	62,8	46,0	51,5	74,3	47,7	55,6	61,3
	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Tabell 1.1D Viktsystemen. Ägarfördelningen.

	Sverige	Storbri- tannien	Väst- tyskland	USA
Fördelningen av låneskulder över				
ägarkategori[i]				
1. Hushåll	38,8	71,8	54,3	60,9
2. Skattebefriade institutioner	54,7	13,7	33,6	23,7
3. Försäkringsbolag	6,5	14,5	12,1	15,4
Fördelningen av eget kapital över	100,0	100,0	100,0	100,0
ägarkategori				
1. Hushåll	60,4	43,5	74,9	74,3
2. Skattebefriade institutioner	30,2	40,7	19,3	21,5
3. Försäkringsbolag	9,4	15,8	5,8	4,2
	100,0	100,0	100,0	100,0

[a] Avser den formella bolagsskattesatsen. För Sverige transformeras denna formella skattesats till en "effektiv" skattesats vars storlek bestäms av företagens möjligheter att sätta av halva årsvinsten till investeringsfond. Se vidare sektion 2.5 i del II. I Tyskland är bolagsskattesatsen 62 procent för behållen vinst jämfört med 36 procent för utdelad vinst.

[b] I Västtyskland baseras lagervärderingen på ett vägt genomsnitt av priserna för under året anskaffade lagervaror. I praktiken är detta likvärdigt med ett system där halva den nominella prisvinsten beskattas.

[c] Endast för Sverige tillämpas avskrivning med ett konstant procenttal på resterande bokfört värde ("30 regeln", här kallad "declining balance"-metoden). Procenttalen för de övriga länderna i tabellen har erhållits genom en nuvärdeberäkning av de skattemässiga avskrivningarna enligt faktiskt gällande regler och transformering till en ekvivalent avskrivningssats vid "declining balance"-avskrivning. De beräkningar av effektiva marginalskatter som utförts i denna studie är dock inte baserade på en sådan transformering. De dataprogram med vars hjälp kalkylerna genomförs är i stället utformade med hänsyn till faktiskt gällande avskrivningsregler. I Storbritannien tillämpas fri avskrivning vid maskininvesteringar och i tabellen ovan anges detta för enkelhets skull motsvara en avskrivningssats på 100 procent. Den exakta tolkningen av fri avskrivning i termer av den i avsnitt B presenterade kalkylmodellen är i stället $f_1 = 0$ och $f_2 = 1$.

[d] Det är endast Tyskland som faktiskt tillämpar en renodlad linjär avskrivning, innebärande att anskaffningskostnaden fördelas över 30 år med lika stora årliga avskrivningar. För de övriga länderna har vi transformerat gällande regler till motsvarande avskrivningstid vid renodlad linjär avskrivning. Den korta avskrivningstiden för Storbritannien motsvarar i verkligheten en kombination av omedelbar avskrivning av halva anskaffningskostnaden och linjär avskrivning av återstoden över 12 år.

[e] I Sverige tillämpas investeringsavdrag på 20 procent för maskiner och 10 procent för byggnader. Vid en formell skattesats på 57 procent motsvarar detta investeringsbidrag på 11,4 resp. 5,7 procent.

[f] För Sverige och USA varierar försäkringsbolagens marginalskatter med inflationen. Skattesatserna i tabellen gäller för en inflationstakt som motsvarar den genomsnittliga prisstegringen åren 1971–80 i resp. land.

[g] Tabellen visar den formella marginalskatten för *realiserad* kapitalvinst. I vårt beräkningsprogram omvandlas denna till motsvarande effektiva marginalskatt för *löpande* kapitalvinst (se not 2). Den effektiva marginalskatten är ungefär hälften så hög som den formella. Se vidare Agell-Södersten (1982) för en närmare presentation av sambandet mellan formell och effektiv marginalskatt för kapitalvinst.

[h] För Storbritannien saknas en uppdelning på näringsgrenar.

[i] För Sverige och Västtyskland finns också separata beräkningar av ägarstrukturen för de tre näringsgrenarna. Se vidare del II, sektion 3.5.

24

Tabell 1.2 Marginell skattebelastning vid investeringar i realkapital i olika länder enligt 1980 års skatteregler. Procent.

	Storbri-tannien	Sverige	Väst-tyskland	USA
Kapitaltyp				
1. Maskiner	-36,8	0,2	44,5	17,6
2. Byggnader	39,3	36,6	42,9	41,4
3. Lager	39,5	68,8	59,0	47,0
Näringsgren				
4. Tillverkningsindustri	-9,6	27,1	48,1	52,7
5. Övrig industri	-5,4	60,5	57,0	14,6
6. Handel	36,2	39,2	44,4	38,2
Finansieringskälla				
7. Lån	-100,8	5,0	-3,1	-16,3
8. Nyemission	-4,2	90,4	62,6	91,2
9. Kvarhållen vinst	30,6	68,2	90,2	62,4
Ägare				
10. Hushåll	42,0	105,1	71,2	57,5
11. Skattebefriade institutioner	-44,6	-51,8	6,3	-21,5
12. Försäkringsbolag	-6,7	18,9	-3,8	23,4
Totalt	3,7	35,6	48,1	37,2

Anm.: Investeringarna förutsätts ge en real avkastning på 10 % före skatt och inflationstakten motsvarar den genomsnittliga prisstegringen 1971–80 i resp. land.

Storbritannien med endast 4 procent. Vid en jämförelse mellan raderna 1–3 framkommer att det är den skattemässiga behandlingen av företagens maskininvesteringar som förklarar den mycket låga "totala" marginalskatten i Storbritannien. Engelsk lagstiftning medger omedelbar avskrivning av maskininvesteringar och för tillverkningsindustrin utgår dessutom investeringsbidrag, som i genomsnitt motsvarar drygt 6 procent av anskaffningskostnaden. Subventioneringen av företagens maskininvesteringar får dessutom ett särskilt kraftigt genomslag på den "totala" marginalskatten, eftersom maskininvesteringarnas andel av de totala investeringarna är väsentligt högre i Storbritannien än i de övriga länderna. Även för Sverige och USA är det maskininvesteringarna som håller nere den "totala" marginalskatten, medan för Tyskland maskininvesteringar är hårdare beskattade än byggnadsinvesteringar. Skillnaden mellan länderna i den effektiva marginalskatten för byggnadsinvesteringar är f ö små.[5] Särskilt i Tyskland och Sverige framstår lagerinvesteringar som den hårdast beskattade kategorin av investeringsobjekt, vilket sammanhänger med att lagervärderingen i dessa länder baseras på den s k först in – först ut principen (FIFO).[6] Härigenom tvingas företagen betala skatt för rent nominella prisvinster på lager, vilket undvikes då värderingen, som i USA och Storbritannien, i stället utgår från sist in – först ut principen (LIFO).

Kraftiga skillnader i effektiv marginalskatt mellan olika näringsgrenar förekommer särskilt i Storbritannien, Sverige och USA, och dessa skillnader sammanhänger främst med olikheter mellan näringsgrenarna i fråga om investeringarnas fördelning mellan maskiner, byggnader och lager. I Storbritannien är andelen maskininvesteringar – som är nettosubventionerade av skattelagstiftningen – särskilt hög inom både tillverkningsindustri och övrig industri, vilket resulterar i att den marginella skattebelastningen för den "genomsnittliga" investeringen blir negativ. För Sverige noteras den högsta skattebelastningen för övrig industri, som är den näringsgren som uppvisar den högsta andelen lager av totala investeringar. Lagerinvesteringen är ju som framgår av tabellen den hårdast beskattade investeringskategorin. Möjligheten till lagernedskrivningar är dessutom jämförelsevis sämre inom övrig industri (som bl a inkluderar byggnadsindustrin, vars lager till stor del utgörs av pågående arbeten). Den låga skattebelastningen för övrig industri i USA förklaras av den gynnsamma skattebehandlingen av främst vatten och energiverk.[7]

Raderna 7–9 visar hur den effektiva marginalskatten varierar beroende på i vilka former sparandet kanaliseras till företagen. Den "genomsnittliga" lånefinansierade investeringen är nettosubventionerad i tre av de fyra länderna. I det fjärde landet, Sverige, är marginalskatten svagt positiv. Orsaken till att lånefinansieringen har en så gynnad ställning är att bolagsbeskattningen i de fyra länderna medger avdrag både för skuldräntor och för avskrivningar (i olika former) som är accelererade i förhållande till den ekonomiskt "korrekta" avskrivningen. I USA och Sverige tillämpas ett "klassiskt" system för beskattning av bolagsvinster, dvs vinsterna beskattas först i företaget och sedan hos ägarna i den mån de delas ut. Denna "dubbelbeskattning" av vinsterna, som i Sverige modifieras genom det s k Annell-avdraget, resulterar i att nyemission är den skattemässigt dyraste formen att kanalisera ägarkapital till företagen. I Storbritannien och Tyskland tillämpas, som framgår av tabell 1.1 särskilda avräkningssystem för aktieägarnas beskattning för att lindra dubbelbeskattningen och härigenom blir nyemissioner gynnade i förhållande till behållna vinstmedel som källa till eget kapital.

Tabell 1.2 visar, slutligen, våra beräkningar av den effektiva marginalskatten för de tre kategorierna av ägare. Kalkylerna avspeglar främst rådande skillnader mellan ägarkategorierna i beskattningen av utdelningar, ränteinkomster och kapitalvinster, men också olikheter ifråga om i vilken utsträckning ägargrupperna fungerar som långivare eller ägare till företagen. Hushållen är den avgjort hårdast beskattade kategorin i samtliga länder. Sverige ligger härvid främst med en skattesats som är högre än 100 procent. Skattebefriade institutioner är däremot nettosubventionerade eller endast lågt beskattade. Den negativa effektiva marginalskatten för skattebefriade institutioner förklaras av att bolagsbeskattningen medger företagen avdrag för både skuldränta och accelererade kapitalavskrivningar. Som vi visat i

26

avsnitt B ovan innebär denna kombination av avdragsmöjligheter, under rimliga förutsättningar i övrigt, att bolagsbeskattningen subventionerar marginella lånefinansierade investeringar.

En viktig uppgift för denna studie har varit att undersöka inflationens inverkan på den effektiva skattebelastningen för marginella investeringsobjekt. Skattesystemen i de fyra länderna är i huvudsak baserade på inkomstbegrepp som är definierade i nominella termer och det är en vanlig uppfattning i debatten att detta skulle medföra att skattetrycket ökar med inflationen. De marginella skattesatser som redovisas i tabell 1.2 är, som nämnts, beräknade för den prisstegringstakt som gällde i respektive land i genomsnitt för åren 1971–80. För Storbritannien var denna inflationstakt 13,6 procent jämfört med 9,4 procent i Sverige, 6,8 procent i USA och endast 4,2 procent i Tyskland. För att undersöka kalkylernas känslighet för dessa inflationsantaganden har vi beräknat den "totala" marginalskatten (motsvarande den nedersta raden i tabell 1.2) för respektive land då inflationen varierar från noll till 15 procent. Resultaten av denna undersökning framgår av *diagram 1.1*.

Det är flera, samtidigt verkande faktorer, som bestämmer hur den effektiva marginalskatten förändras genom inflationen. De skattemässigt tillåtna avskrivningarna baseras, som framgått, på kapitalföremålens anskaffningskostnader. Vid inflation urholkas därför avskrivningarnas reala värde. Lagervärderingsreglerna i Sverige och (delvis också) i Tyskland, bygger vidare på den s k FIFO-principen, vilket skärper skattetrycket vid inflation eftersom företagen måste betala skatt också för rent nominella prisvinster på lager.

Också finansiärernas beskattning drivs upp av inflationen. Företagens långivare – hushåll och institutioner – är sålunda skattskyldiga för nominella ränteinkomster, alltså för den del av ränteinkomsterna som enbart utgör kompensation för inflationen, och vidare baseras aktievinstbeskattningen på nominellt beräknade kursvinster. Reglerna för försäkringsbolagens beskattning är ytterligare en faktor som kan höja skattetrycket vid inflation. I USA och Sverige har försäkringsbolagen nämligen möjligheter till skattefria reservavsättningar, vars storlek regleras i lagstiftningen till att motsvara en konstant nominell förräntning av försäkringsbolagens reserver. Då inflationen driver upp den nominella avkastningen på försäkringsbolagens kapitalplaceringar minskar därför, realt sett, värdet av de skattefria reservavsättningarna.

I skattesänkande riktning verkar emellertid det faktum att företagen i alla fyra länder har full avdragsrätt för nominella räntekostnader vid bolagsbeskattningen. Eftersom stegringen av den nominella låneräntan vid inflation kan uppfattas som en kompensation för urholkningen av skuldernas realvärde, innebär denna avdragsrätt i praktiken att företagen kan göra avdrag för den av inflationen orsakade reala låneamorteringen. Om bolagsskattesatsen är högre än långivarnas (genomsnittliga) marginalskatt,

27

Diagram 1.1 Total marginalskatt vid olika inflationstakt
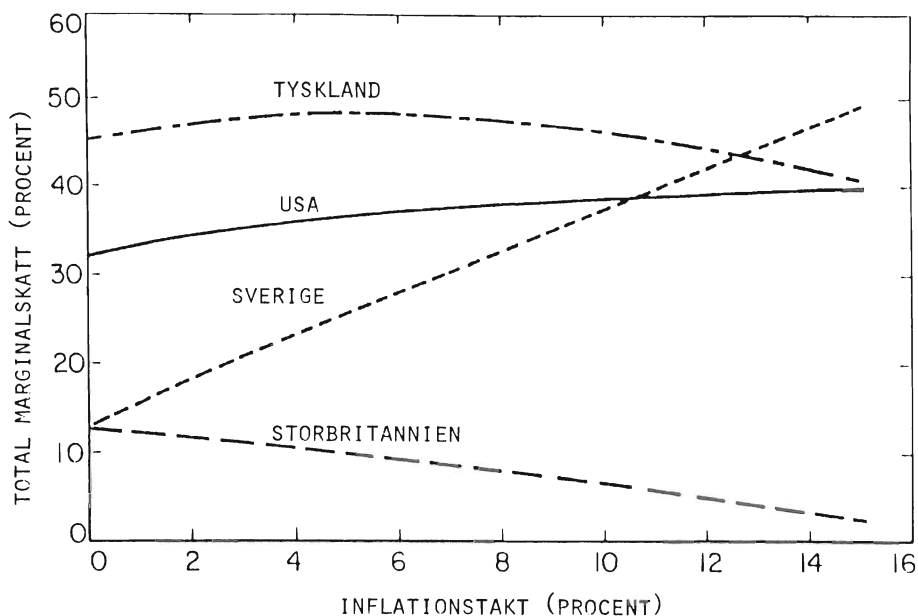
uppväger avdragsrätten för låneräntorna i själva verket den skatteskärpande effekten av att långivarna är skattskyldiga för nominella ränteinkomster.

Inflationens inverkan på den effektiva skattebelastningen beror således av en rad faktorer, vilka dock verkar med mycket varierande kraft i olika länder. Detta avspeglas tydligt i diagram 1.1. I stort sett är det bara för Sverige, som inflationen leder till en kraftigt ökad effektiv skattebelastning. Den effektiva "totala" marginalskatten i Sverige är sålunda nästan tre gånger så hög vid 9,4 procents inflation – motsvarande den genomsnittliga prisstegringstakten åren 1971–80 – som vid stabila priser. För Storbritannien däremot, är den "totala" marginalskatten vid den faktiska inflationstakten (13,6 procent) nästan bara en fjärdedel så hög som vid konstanta priser.

I Sverige drivs skattebelastningen upp genom utformningen av avskrivnings- och lagervärderingsreglerna. Därtill kommer att det reala värdet av företagens s k Annell-avdrag vid nyemission urholkas av inflationen, eftersom dessa avdrag utgår i förhållande till de nominella emissionsbeloppen. Avdragsrätten för företagens skuldräntor uppväger visserligen långivarnas beskattning av nominella ränteinkomster, men skillnaden mellan bolagens skattesats och genomsnittet för långivarnas marginalskatt är avsevärt mindre i Sverige än i de övriga länderna.[8] En ytterligare faktor som

28

ökar skattetrycket vid inflation, är, som nämnts, försäkringsbolagens beskattning.

I Storbritannien baseras lagervärderingen på den s k LIFO-principen, vilket medför att företagen undgår att betala skatt för rent nominella prisvinster. De skattemässiga avskrivningarna av maskiner är vidare opåverkade av inflationen genom att företagen har rätt till omedelbar avskrivning. Genom att bolagen dessutom kan dra av ränteutgifter mot en bolagsskatt på 52 procent medan långivarnas marginalskatt på motsvarande ränteinkomster i genomsnitt är 26 procent, kommer den "totala" marginalskatten att falla dramatiskt med ökande inflation.

Den marginella skattebelastningen i USA och Tyskland är i långt mindre grad känslig för förändringar i inflationen. För USA sammanhänger detta dels med att företagen har möjlighet att utnyttja LIFO-principen vid lagervärderingen, dels med att den skattesänkande effekten av att bolagsskattesatsen överstiger genomsnittet för långivarnas marginalskatt är långt kraftigare än i t ex Sverige. Denna senare omständighet uppväger i väsentlig utsträckning den urholkning av avskrivningarnas realvärde inflationen medför. Lagervärderingen i Tyskland innebär att företagen är skattskyldiga för halva den nominella prisstegringen på lagertillgångar och därtill kommer att avskrivningarna, liksom i de övriga länderna, baseras på historiska anskaffningskostnader. I skattesänkande riktning verkar emellertid det faktum att bolagsskattesatsen överstiger genomsnittet för långivarnas marginalskatt med hela 37 procentenheter. Det är, slutligen, också viktigt att notera att kapitalvinster på aktier är skattefria i Tyskland. Kapitalvinstbeskattningen är ju, som nämnts, en faktor som skärper skattetrycket vid inflation i de övriga länderna.

D. En jämförelse mellan skattesystemen

I det föregående har vi redovisat effektiva marginalskatter i de fyra länderna, beräknade med hänsyn till den inflationstakt och det "viktsystem" i form av ägarstruktur, finansieringsmönster etc, som gäller för respektive land. De skillnader i effektiv skattebelastning mellan länderna som framgår av *tabell 1.2* avspeglar därför olikheter både i fråga om skattesystemens utformning och viktsystemen. För att renodla en jämförelse mellan skattesystemen skall vi därför komplettera uppgifterna i *tabell 1.2* med motsvarande beräkningar av effektiva marginalskatter utförda med samma inflationstakt och viktsystem för alla fyra länder. Det kan sägas vara godtyckligt vilket viktsystem som väljs för en sådan jämförelse, men för svenskt vidkommande har det uppenbart störst intresse att utgå från svenska vikter. Beräkningarna som redovisas i *tabell 1.3* kan då sägas visa de marginalskatter som skulle gälla i Sverige om vi hade tillämpat de skatteregler som var i kraft 1980 i respektive Storbritannien, Tyskland och USA.

Då vi använder det svenska viktsystemet och den svenska inflationsstakten för Storbritannien, Tyskland och USA sjunker den "totala" marginalskatten dramatiskt jämfört med motsvarande "faktiska" marginalskatt i tabell 1.2. Den viktigaste förklaringen till detta är att den skattemässigt gynnsamma lånefinansieringen ges större tyngd i tabell 1.3. Andelen lånefinansiering är ju, som framgår av tabell 1.1C, väsentligt större i Serige än i övriga länder (med undantag för tillverkningsindustrin i Tyskland).

Genom att jämföra viktsystemen i tabell 1.1 för de fyra länderna kan man mer i detalj för varje land finna förklaringar till varför marginalskatterna förändras. Samtidigt som den "totala" marginalskatten för Storbritannien faller från 3,7 procent till −30,9 procent, ökar marginalskatterna för var och en av finansieringskällorna. Denna senare förändring förklaras av att de i Storbritannien starkt gynnade maskininvesteringarna ges mindre tyngd med svenska vikter.

Den starkt reducerade marginalskatten för USA vid lånefinansiering hänger samman med att högt beskattade hushåll fått lägre och skattebefriade institutioner större vikt. Att marginalskatterna för nyemission och kvarhållen vinst inte förändras nämnvärt förklaras av flera motverkande faktorer. Å ena sidan gäller, liksom vid lånefinansieringen, att högt beskattade hushåll ges mindre tyngd och skattebefriade institutioner mera tyngd. Å andra sidan ges näringsgrenen övrig industri, som i USA är särskilt lågt beskattad och har en väsentligt större andel av företagssektorns totala finansiering med eget kapital än i Sverige, mindre vikt.

30

Tabell 1.3 Marginell skattebelastning vid investeringar i realkapital i olika länder enligt 1980 års skatteregler. Svenska vikter. Procent

	Storbri-tannien	Sverige	Väst-tyskland	USA
Kapitaltyp				
1. Maskiner	-87,1	0,2	15,0	-8,1
2. Byggnader	-9,1	36,6	-0,7	15,6
3. Lager	1,0	68,8	42,7	9,9
Näringsgren				
4. Tillverkningsindustri	-38,8	27,1	21,1	12,2
5. Övrig industri	-24,2	60,5	15,2	-8,6
6. Handel	-11,3	39,2	15,3	0,1
Finansieringskälla				
7. Lån	-99,6	5,0	-56,6	-49,6
8. Nyemission	17,4	90,4	47,2	90,2
9. Kvarhållen vinst	45,3	68,2	103,9	65,9
Ägare				
10. Hushåll	27,5	105,1	70,8	49,3
11. Skattebefriade institutioner	-109,4	-51,8	-41,7	-56,5
12. Försäkringsbolag	-19,7	18,9	-17,7	37,5
Totalt	-30,9	35,6	18,9	6,1

Anm.: Investeringarna förutsätts ge en real avkastning på 10 % före skatt. Inflationstakten är 9,4 %, motsvarande den genomsnittliga prisstegringen i Sverige åren 1971–80.

Också för Tyskland sammanhänger den minskade marginalskatten vid lånefinansiering med en lägre ägarandel i Sverige för hushållen och en högre andel för skattebefriade institutioner. Förändringarna i marginalskatt vid finansiering med eget kapital – nyemission och kvarhållen vinst – har mer komplicerade förklaringar som sammanhänger både med investeringarnas (kapitalstockens) fördelning mellan kapitaltyper och näringsgrenar och olikheter mellan näringsgrenarna i finansieringsmönster.

Den renodlade jämförelse av skattesystemen som ges i tabell 1.3 tyder alltså på att Sverige har det ur incitamentsynpunkt klart ogynnsammaste skattesystemet. Slutsatsen gäller också för de flesta av de kombinationer av "genomsnittliga" investeringar som visas i tabellen. Vi kan vidare konstatera att den ogynnsamma bilden av det svenska skattesystemet inte bestäms av bolagsbeskattningen. För skattebefriade institutioner, för vilka "skattekilen" p–s enbart beror av bolagsbeskattningen, är det bara det engelska skattesystemet (med bl a omedelbar avskrivning av hela anskaffningskostnaden för maskiner och halva anskaffningskostnaden för byggnader) som ger en nämnvärt lägre effektiv marginalskatt. Som framgår av tabell 1.1B är finansiärerna – hushåll och försäkringsbolag – i Sverige i allmänhet hårdare beskattade för ränteinkomster, utdelningar och kapitalvinster än vad som är fallet i de övriga länderna.[9] Det är detta förhållande som är den viktigaste förklaringen till att Sverige uppvisar den högsta "totala" marginalskatten.

31

Att Sverige enligt den tidigare tabell 1.2 har en så gynnsam position, med den näst lägsta "totala" marginalskatten, beror alltså huvudsakligen på det svenska viktsystemet, som bl a ger särskilt stor tyngd åt den förmånliga lånefinansieringen och särskilt liten tyngd åt högt beskattade hushåll. Men också för de övriga länderna gäller, att lånefinansiering är den skattemässigt mest gynnade finansieringsformen och att hushållen är den hårdast beskattade ägarkategorin.

Skillnaden mellan tabellerna 1.2 och 1.3 i rangordningen mellan länderna kan därför ses som ett uttryck för att den svenska företagssektorn, både vad gäller företagens finansiering och fördelningen mellan de tre ägarkategorierna, är bättre anpassad till ojämnheterna i skattesystemet. Vi kan bara spekulera om orsakerna till detta och det är naturligtvis en rad omständigheter som förklarar de faktiska skillnaderna mellan viktsystemen för de fyra länderna. En bidragande orsak till att skattemässigt gynnsamma kombinationer har särskilt stor tyngd i Sverige kan emellertid vara just nivån för skattetrycket. Vid lägre marginalskatter för ägargrupperna (än som gäller i Sverige) framstår en anpassning till ojämnheterna i skattesystemet inte som lika angelägen.

E. Marginell skattebelastning enligt nya skatteregler

De kalkyler av marginell skattebelastning som presenterats ovan gäller de skatteregler som var i kraft 1980. För Sverige redovisas dock i del II, sektion 4, motsvarande beräkningar med beaktande av en del senare tillkomna regler. Det gäller bl a de reformer av den personliga inkomstbeskattningen som beslutades av riksdagen i juni 1982 och som avses träda i full kraft 1985. I detta avsnitt skall vi i kortfattad form aktualisera också dessa beräkningar genom att ta hänsyn till regler som beslutats eller föreslagits under tiden juni 1982–maj 1983. (Som jämförelse återges marginell skattebelastning enligt 1980 års regler i den första kolumnen i tabell 1.4).

Effekterna på marginell skattebelastning av de nya marginalskatterna för hushållen redovisas i tabell 4.23 (del II, sektion 4.2), under rubriken "1985 Rules". Beräkningarna, som återges i andra kolumnen i tabell 1.4, tar inte hänsyn till det s k skattesparandet, men väl till den skattereduktion för hushållens aktieutdelningar som infördes 1981. (Dessa regler presenteras utförligt i del II, sektion 2.8.) Skattereduktionen sänker hushållens marginalskatt för mottagen utdelning (så att $m_d < m$) och som framgår både av den formella analysen i avsnitt B ovan och av diskussionen i del II, sektion

Tabell 1.4 *Marginell skattebelastning vid investeringar i realkapital enligt nya skatteregler. Procent*

	1980	Nya marginal-skatter för hushållen	1983 års reg-ler (gynnsam tolkning)	1984 års regler
Kapitaltyp				
1. Maskiner	0,2	−5,6	−5,1	26,6
2. Byggnader	36,6	30,9	−11,6	38,4
3. Lager	68,8	63,7	63,9	63,2
Näringsgren				
1. Tillverkningsindustri	27,1	22,9	8,5	37,5
2. Övrig industri	60,5	51,3	36,9	59,7
3. Handel	39,2	33,2	19,2	44,2
Finansieringskälla				
1. Lån	5,0	−1,5	−18,6	15,3
2. Nyemission	90,4	70,7	70,7	90,5
3. Kvarhållen vinst	68,2	64,5	52,8	72,3
Ägare				
1. Hushåll	105,1	91,4	81,9	99,5
2. Skattebefriade institutioner	−51,8	−51,8	−69,0	−29,5
3. Försäkringsbolag	18,9	18,9	8,4	34,8
Totalt	35,6	30,1	15,8	42,9

Anm.: Liksom i tidigare redovisade kalkyler förutsätts här att investeringarna ger en real avkastning på 10 % före skatt och att inflationstakten är 9,4 % (motsvarande den genomsnittliga prisstegringen 1971–80).

2.8, påverkar detta marginell skattebelastning endast vid finansiering med nyemission.

Skattereduktionen för hushållens utdelningar avskaffades dock fr o m 1983 som en av de första åtgärderna på skatteområdet från den nya socialdemokratiska regeringen. Härigenom ökar, enligt våra beräkningar, marginell skattebelastning vid nyemission från 70,7 procent till 82,2 procent, medan marginalskatterna vid övriga finansieringsalternativ är oförändrade. Genom att nyemissioner endast svarar för 2 procent av företagens finansiering (se tabell 1.1C) blir effekterna av denna skatteskärpning på den "totala" marginalskatten och på marginalskatterna för de olika ägargrupperna obetydliga.

Hösten 1982 aviserades flera förändringar i bolagsbeskattningen avsedda att gälla enbart beskattningsåret 1983 (Prop. 1982/83:50). Innebörden av dessa förändringar är dels att företagen åläggs sätta av 20 procent av sina vinster till särskilda investeringsfonder, dels att företagen påförs en särskild, icke avdragsgill, 20-procentig avgift på utdelningarna.

Genom de nya reglerna höjs gränsen för maximalt tillåtna skattefria avsättningar till investeringsfonder (allmänna och särskilda) från 50 till 70 procent av årsvinsten. Höjningen av gränsen behöver naturligtvis i sig inte

33

leda till ökade fondavsättningar, eftersom den obligatoriska avsättningen till de *särskilda* investeringsfonderna mycket väl kan motsvaras av minskade avsättningar till de allmänna investeringsfonderna. Men genom den vinstuppgång, som kan förväntas som en följd av devalveringen, är det ändå rimligt att räkna med att fondavsättningarna faktiskt kommer att öka under kommande år. För de mest vinstgivande företagen kan den tillfälligt höjda gränsen för maximala avsättningar då utgöra en välkommen möjlighet att undvika beskattning av förväntade vinstökningar.

Enligt en med avseende på investeringseffekterna gynnsam tolkning kan de nya skattereglerna i kombination med den förväntade vinstuppgången komma att leda till att en väsentligt större grupp av företag än som nu är fallet faktiskt kan finansiera sina marginella investeringsobjekt med fondmedel. Det förefaller rimligt att utgå från att det ökade fondutnyttjandet då i första hand kommer att gälla byggnadsinvesteringar – för vilka lönsamheten av fondutnyttjande är störst – medan marginella maskininvesteringar, av de skäl som redovisas i del II, sektion 2.5, fortfarande kommer att skrivas av via de reguljära avskrivningsreglerna. Tredje kolumnen i tabell 1.4 visar konsekvenserna för marginell skattebelastning av denna "gynnsamma" tolkning av skatteomläggningen. Uttryckt i termer av den formelapparat som utvecklades i avsnitt B innebär denna tolkning att $f_2 = 1$ för byggnadsinvesteringar, medan för maskininvesteringar $f_2 = 0,3$. f_2 betecknar den andel av investeringskostnaden som kan skrivas av redan under anskaffningsåret.

Våra beräkningar i kolumn 3 tar vidare fasta på att skatteomläggningen endast innebär en temporär beskattning av utdelningarna och en temporärt utökad möjlighet till skattefria fondavsättningar. Vid bedömningar av lönsamheten av en investeringsökning torde företagen räkna med att som tidigare kunna sätta av högst 50 procent av framtida vinster till investeringsfonderna. Det innebär i sin tur att den "effektiva" bolagsskattesatsen – som just tar hänsyn till fondavsättningsmöjligheten – inte påverkas (jämför ekv. 4.10 i del II, sektion 2.5). Som framgår av sektion 2.5 är denna "effektiva" bolagsskattesats f n ca 35 procent.

Det är emellertid ytterst tveksamt om de, ur investeringssynpunkt, gynnsamma skatteeffekterna enligt kolumn 3 verkligen kommer att förverkligas. Troligare är att den utökade möjligheten för avsättningar till investeringsfonder inte kommer att räcka till för att möjliggöra för företagen att finansiera de marginella investeringsobjekten med fondfrisläpp. Trots nya skatteregler kommer i så fall fondfrisläppen fortfarande att fungera som generella vinstsubventioner. Skatteomläggningen skulle därmed sakna betydelse för lönsamheten av det marginella investeringsobjektet och lämna den marginella skattebelastningen oförändrad. Detta pessimistiska tolkningsalternativ överensstämmer med den andra kolumnen i tabell 1.4.

I den reviderade finansplanen våren 1983 (Prop. 1982/83:150) presenteras vissa permanenta förändringar i bolagsbeskattningen avsedda att gälla fr o m 1984. Den statliga bolagsskatten sänks från nuvarande 40 procent till 32

34

procent, vilket innebär att den formella bolagsskattesatsen (som bestäms av både den statliga och den kommunala beskattningen) sjunker med ca 5 procentenheter. Vidare begränsas maximal lagernedskrivning till 50 procent jämfört med nuvarande 60 procent. Som framgår av översikten i tabell 1.1A medgavs företagen 1980 (och 1981) ett särskilt avdrag på 20 procent av anskaffningskostnaden för maskininvesteringar och 10 procent för byggnads-investeringar vid både statlig och kommunal inkomsttaxering. Vid en formell bolagsskatt på 57 procent är dessa avdrag likvärdiga med investeringsbidrag på 11,4 resp. 5,7 procent. Denna subventionering (som vad gäller maskiner fr o m 1982 tekniskt var utformad som ett särskilt avdrag vid redovisningen av mervärdesskatt motsvarande ett investeringsbidrag på 10 procent) föreslås nu avskaffad fr o m våren 1984.

Effekterna av dessa skärpningar i bolagsbeskattningen från 1984 redovisas i den fjärde kolumnen i tabell 1.4. De nya reglerna medför en ökning av den "totala" marginalskatten med nästan en halv gång, från 30 till 43 procent. Skatteskärpningen är särskilt dramatisk för maskininvesteringar genom bortfallet av det tidigare investeringsbidraget. För lagerinvesteringar, däremot, blir skattebelastningen oförändrad, trots den reducerade möjlig-heten till nedskrivning. Förklaringen till detta är att nominella prisvinster på lager samtidigt blir mindre hårt beskattade genom att den formella bolagsskattesatsen sänks.

Den fjärde och sista skatteförändring vi skall studera gäller det förslag till s k vinstdelning som presenterades i maj 1983 av en kommitté inom finansdepartementet. Kommittén föreslår att en särskild vinstdelningsavgift på 20 procent tas ut av företagen fr o m 1984 på en vinst som i flera viktiga avseenden avviker från den vinst som används som underlag för den vanliga bolagsbeskattningen. Vinstdelningsavgiften är tänkt att fungera parallellt med den reguljära vinstskatten, vilket betyder att Sverige i praktiken skulle få ett tvådelat och ytterst komplicerat system för bolagsbeskattning. När detta skrives, i maj 1983, är det emellertid omöjligt att bedöma om kommitténs förslag verkligen kommer att accepteras av regering och riksdag. Vi nöjer oss därför med att mycket kortfattat beskriva konstruktionen av den föreslagna avgiften och ange hur den enligt våra beräkningar påverkar marginell skattebelastning.

Underlaget för vinstdelningsavgiften är företagets (till bolagsskatt) beskattningsbara vinst efter avdrag för bl a vinstskatt och efter vissa korrigeringar för inflationen. Inflationskorrigeringen innebär att företaget får räkna upp sina skattemässiga avskrivningar med hänsyn till prisföränd-ringarna men också att kapitalvinster på låneskulder räknas in i avgiftsun-derlaget. Genom vissa ytterligare justeringar av den beskattningsbara vinsten kommer bl a avsättningar till lagerreserver och Annellavdrag vid nyemission att drabbas av den nya avgiften. Avsättningar till investerings-fonder blir däremot avdragsgilla. Slutligen får, enligt förslaget, vinstdel-ningsavgiften för ett visst år räknas av mot den vanliga vinstbeskattningen

35

under påföljande år. Genom denna regel och genom att avgiften baseras på beskattningsbar vinst efter skatt kommer de båda delarna av det "totala" bolagsskattesystemet att vara ömsesidigt beroende.

Den föreslagna tvådelade konstruktionen av "bolagsbeskattningen" visar sig enligt våra kalkyler ha en obetydlig inverkan på marginell skattebelastning.[10] Den "totala" marginalskatten stiger med 1,2 procentenheter, från 42,9 procent (enligt kolumn 4, tabell 1.4) till 44,1 procent. Den viktigaste förklaringen till detta är den neutraliserande inverkan som följer av möjligheten att inflationsjustera skattemässiga avskrivningar och det faktum att avgiften dels baseras på vinsten efter skatt, dels är avdragsgill vid vinstbeskattningen. För lånefinansierade investeringar, för vilka löpande kapitalvinster blir avgiftsbelagda (som motvikt till att hela den *nominella* låneräntan är avdragsgill), uppkommer dock en viss skatteskärpning. Den effektiva marginalskatten höjs från 15,3 (enligt kolumn 4) till 19,5 procent.

36

Noter

[1] En närmare härledning av företagets diskonteringsränta vid finansiering med eget kapital återfinns i slutrapporten från forskningsprojektet. Se också King (1977). Följande intuitiva resonemang kan klargöra innebörden av de uttryck som ges i texten: Företagets diskonterings-ränta ϱ kan uppfattas som den lägsta nominella avkastning *efter* bolagsskatt företaget kan acceptera på sina investeringar och problemet gäller hur denna lägsta avkastning kan bestämmas. Om avkastningen på ett marginellt investeringsobjekt tillförs ägarna i form av utdelning och utdelningar beskattas med skattesatsen m_d, återstår netto efter skatt i ägarnas händer $\varrho(1-m_d)$. Antag nu att den nominella avkastning netto efter skatt ägarna kan uppnå vid *alternativa* finansiella placeringar är $i(1-m)$, där i är marknadsräntan och m den marginella inkomstskatten. För att ägarna skall vara beredda att finansiera företagets investeringar genom att delta i en nyemission måste det då på marginalen gälla att $\varrho(1-m_d) = i(1-m)$. Företagets diskonteringsränta vid finansiering med nyemission blir därför $\varrho = i(1-m)/(1-m_d)$.

Beslutet att behålla en del av företagsvinsten för att "självfinansiera" investeringarna innebär att en aktieägare vars marginalskatt för utdelningar är m_d får en investering i företaget på en krona i utbyte mot att själv få disponera beloppet $1-m_d$, netto efter skatt. Denna relation mellan investerat och "uppoffrat" belopp innebär att företaget kan nöja sig med en avkastning efter bolagsskatt på investeringar som finansieras med behållen vinst som är endast $1-m_d$ gånger den som enligt ovan gäller vid nyemissionsfinansiering. Men för att vara acceptabel från aktieägarnas synpunkt måste vinstnedplöjning i företaget resultera i en kursstegring för företagets aktier som en förväntan om framtida utdelningsökningar. Vi antar här – se not 2 – att den *effektiva* skattesatsen för värdestegringen är z, vilket innebär att andelen $1-z$ av värdestegringen återstår i ägarnas händer, netto efter skatt. Varje krona i värdestegringsvinst efter skatt svarar alltså mot en värdestegring före skatt på $1/(1-z)$, och detta innebär att diskonteringsräntan vid finansiering med behållen vinst måste räknas upp $1/(1-z)$ gånger jämfört med den ovan angivna diskonteringsräntan vid nyemission.

Kombinerar vi de motverkande effekterna av utdelningsbeskattningen och av beskattningen av värdestegringar, blir då resultatet att diskonteringsräntan vid självfinansiering motsvarar faktorn $(1-m_d)/(1-z)$ gånger diskonteringsräntan vid nyemission, dvs $\varrho = i(1-m)/(1-z)$.

[2] Beskattningen av kapitalvinst på aktier är i Sverige, liksom i andra länder, utformad som en skatt på realiserad vinst, vilket innebär att skatten tas ut först i samband med avyttring. Det är emellertid möjligt, vilket visas i slutrapporten till forskningsprojektet, att transformera gällande regler för beskattning av realisationsvinst till en i viss mening likvärdig ("effektiv") skatt på löpande nominell värdeförändring. Se även Agell-Södersten (1982), Appendix 2.

[3] En undersökning av den marginella skattesatsen t för en given avkastning före skatt ("fixed-p") visar hur skattesystemet påverkar incitamenten att kanalisera sparande genom olika kanaler (lån, nyemission etc) och till olika typer av realkapital inom olika näringsgrenar. Men med en fri och väl fungerande kapitalmarknad och vinstmaximerande företag skulle vi förvänta oss en anpassning i fördelningen av sparande och investeringar till rådande skillnader i marginell skattebelastning, tills ett jämviktsläge etableras där avkastningen efter skatt på marginalen är densamma för olika placeringsalternativ. Ett alternativt sätt att bestämma den effektiva skattebelastningen är därför, som nyss nämnts, att basera kalkylerna på en given marknadsränta och beräkna vilken avkastning före skatt (p) företagen måste kräva av sina investeringsobjekt med hänsyn till denna marknadsränta. Denna ansats innebär att för varje kategori av ägare, avkastningen efter skatt (s) blir densamma oberoende av hur sparandet kanaliseras till företagen. Genom skillnader i marginalskatt, m, kommer avkastningen efter skatt dock att variera mellan de tre kategorierna hushåll, skattebefriade institutioner och försäkringsbolag. I sektion 4, del II, redovisas vissa beräkningar av marginell skattebelastning, som baseras på denna ansats (som benämns "fixed-r" case).

[4] En fullständig redogörelse för resultaten från den svenska delen av undersökningen återfinns i sektion 4, del II i denna skrift.

5 Det bör påpekas att en jämförelse mellan länderna i *tabell 1.2* fångar in såväl ev. skillnader i skattelagstiftning som skillnader i fråga om investeringarnas finansiering och ägarstrukturen. Också skillnader i inflationstakt mellan länderna är av betydelse. Se vidare avsnitt D.

6 I Tyskland baseras lagervärderingen på ett vägt genomsnitt av priserna för under året anskaffade lagervaror. I praktiken är detta system likvärdigt med ett system där halva den nominella prisvinsten beskattas. Formellt innebär detta att v = 0,5 (se avsnitt B ovan), medan vid renodlad FIFO-värdering v = 1.

7 Dessa s. k. utilities är i allmänhet privatägda i USA och ingår därför i den amerikanska delen av undersökningen.

8 I själva verket minskar värdet av de svenska företagens ränteavdrag vid inflation, eftersom inflationen samtidigt gör avsättningar till investeringsfonder (IF) mer lönsamma. Inflationen reducerar nämligen kostnaden för IF-avsättningar genom att reducera realvärdet av de skattemässiga avskrivningar företagen går miste om vid IF-utnyttjande. Se vidare sektion 2.5 i del II i denna skrift, där det bl a framgår hur den effektiva bolagsskattesatsen τ bestäms dels av den formella bolagsskattesatsen på 57 procent, dels av företagens möjligheter till IF-avsättningar. Skillnaden mellan den effektiva bolagsskattesatsen τ och den genomsnittliga marginalskatten för långivarna varierar i Sverige mellan 7 procentenheter vid 9,4 procents inflation och 17 procentenheter vid stabila priser.

9 Uppgifterna i tabell 1.1B inkluderar inte effekterna av de sparstimulanser i olika former som utgått till hushållen i Sverige sedan slutet av 1970-talet. Sparstimulanserna ändrar emellertid inte slutsatsen att de svenska hushållen är hårdare beskattade än hushållen i de övriga länderna. Se vidare sektion 2.8 och 4.2 i del II.

10 En närmare redogörelse över hur vinstdelningsavgiften behandlats i vår kalkylmodell kan fås från förf.

DEL II*

CHAPTER 4
SWEDEN

39

1. Introduction

During the post-war period, the total tax yield in Sweden increased dramatically from 25 percent of GNP in 1955 to 50 percent in 1979. As shown in Table 4.1, this increase was accompanied by substantial changes in the tax structure. Social security contributions, mainly by employers, accounted for roughly half of the 25 percentage points increase, thereby raising their share of total tax receipts more than tenfold. The share of taxes on personal incomes and corporate profits, on the other hand, fell markedly.

The structural changes in the tax system, apparent from Table 4.1, reflect the growth of the public sector and a marked shift in the direction of fiscal policy from the 1950s to the 1970s. The large devaluation of the Swedish crown in 1949 greatly improved the international competitiveness of Swedish industry. Through moderate wage increases the favorable relative cost position was preserved for more than a decade, making the 1950's a period of high rates of profit and steadily expanding business investment. In this situation, stabilization policy during periods of excess demand was directed mainly at containing private investment. The statutory corporate tax rate was raised, and the use of free depreciation allowances for machinery and equipment was gradually phased out. The rules of inventory valuation were tightened; and in two instances, in 1952–53 and 1955–57, special investment taxes were introduced to reduce the rate of private capital formation.

Towards the end of the 1950s this type of fiscal policy was abandoned as economic growth became a more central economic objective. Several changes in the tax system shifted the burden of the stabilization mechanism from corporate investment to private consumption. The system of investment funds was revised and put to active use. Household taxation was raised by way of introducing a general sales tax in 1960 as well as a new payroll tax for social security. As a result, the budget surplus increased dramatically.

With the emergence of balance of payments deficits from the mid 1960s, expansion of industrial investment received greater emphasis in policy making. There was a liberalization of the rules for fiscal depreciation and also a more frequent use of the special Swedish scheme of subsidizing investment, that is, the investment funds system (described in detail in Section 2.5 below). In addition, the investment tax component of commodity taxation was abolished when the general sales tax was replaced by a value-added tax in 1969.

The external imbalances, which first arose in the mid 1960s, were much aggravated by the oil crises a decade later. The problem was further worsened by the rapid wage increases and the exchange rate policies of the

Table 4.1 *Sources of Tax Revenue, Sweden, 1955–79*

Revenue Source	Share of Total Receipts (percent)						Total Receipts (BSEK)[a]
	1955	1960	1965	1970	1975	1979	1979
Taxes on Personel Incomes (including Capital Gains)	53.1	52.4	48.3	49.6	46.0	42.4	97.209
Taxes on Corporate Incomes	13.8	8.8	6.1	4.4	4.3	3.1	7.065
Social Security Contributions	2.1	4.3	12.0	14.9	19.5	27.1	62.135
– by Employers	2.1	1.7	8.8	11.7	18.3	25.9	59.477
– by Employees	–	2.6	1.8	2.0	–	–	0.0
– by Self-Employed	–	–	1.4	1.2	1.2	1.2	2.658
Payroll Taxes	0.0	0.0	0.0	1.1	4.4	2.6	5.868
Property Taxes	2.4	2.2	1.8	1.5	1.1	0.9	2.089
Value Added Tax	–	1.9[b]	10.3[b]	10.2	11.9	13.3	30.580
Taxes on Specific Goods and Services	26.6	28.4	19.9	16.6	11.1	9.1	20.927
– Alcohol	n.a.	n.a.	5.0	4.2	3.3	2.6	5.916
– Tobacco	,,	,,	2.8	2.4	1.5	1.1	2.582
– Energy	,,	,,	5.3	4.2	3.2	3.3	7.578
– Other	,,	,,	6.8	5.8	3.1	2.1	4.851
Miscellaneous Taxes	2.0	2.0	1.6	1.7	1.7	1.5	3.357
Total Receipts (percent)	100.0	100.0	100.0	100.0	100.0	100.0	
Total Receipts (BSEK)[a]	12.957	19.604	40.385	69.480	132.233	229.230	
Gross Domestic Product (BSEK)[a]	50.800	72.190	113.450	169.902	298.915	456.007	
Share of Taxes in GDP (percent)	25.51	27.16	35.60	40.89	44.24	50.27	

Source: *Revenue Statistics of OECD Member Countries 1965–80*, (Paris, 1981).
[a] Billion of Swedish Crowns.
[b] Refer to sales taxes.

second half of the 1970's. The long term policy for eliminating the balance of payments deficit has remained one of promoting industrial growth. This has meant, for example, that firms during the second half of the 1970's and the early 1980's have been able to count on using their investment funds almost continuously for new investment. Several kinds of *ad hoc* measures, such as extra investment allowances, have also been used to stimulate investment. Other recent changes in the tax system include further mitigation of the double taxation of dividends and special tax concessions to household savings.

In the last twenty years there have been major changes in the redistributive

role of the Swedish tax system. During the 1960's interest in economic growth gave way to concern about income distribution. The individual income tax became more progressive after the mid 1960's. A major reform of the income tax was enacted in 1971, involving, among other things, a shift from joint to individual taxation of spouses. The reform resulted in a marked increase in progressivity combined with the abolition of the deduction allowed for the local government income tax. The latter meant that an increase in local income tax no longer automatically implied a reduction of national income tax liability. As a result, effective marginal tax rates rose.

The enhanced progressivity built into the tax schedule by the reform of 1971 and the simultaneous occurrence of rapid increases in local income tax rates and, in particular, of high rates of inflation caused a "marginal tax problem" for the rest of the 1970s. To secure a given increase in real after tax earnings, it was necessary to ask for high increases in nominal pre-tax wages. During the early 1970's, the government attempted to solve this problem by way of annual *ad hoc* adjustments to the taxation of earned income, carried out prior to the rounds of central collective bargaining. These adjustments, which involved reductions in income tax and increases in the payroll tax, made possible increases in real after tax earnings at rates acceptable to the largest groups of wage earners. At the same time, the tax adjustments were designed to achieve a further redistribution of income. (For a discussion of this period, see Normann, 1978 and 1982.)

The policy of making annual *ad hoc* adjustments to the tax schedule was changed in 1979 as part of the new tax policy of the non-socialist government which came into power in 1976. The income tax schedules were indexed to the consumer price index. In addition, some small steps were taken toward a lowering of marginal tax rates.

The beginning of the 1980s witnessed some important changes in attitudes with a growing concern about possible detrimental effects of high marginal tax rates. More emphasis was placed on efficiency and incentives, and less on the goal of an equitable distribution of income. A manifestation of this was the agreement in April 1981 between two of the three parties in the non-socialist coalition government and the opposition Social Democratic Party to a major reform of personal income taxation. The reform, enacted by Parliament in June 1982, is scheduled to be fully implemented by 1985, following a two year phase-in period. It is designed to cut marginal income tax rates for the majority of full time wage earners to a maximum of 50 percent, while simultaneously lowering the value of interest deductions for earners in the higher marginal rate brackets to 50 percent (see Section 2.1 below for a more detailed account of this tax reform).

2. The Tax System

2.1 The Personal Income Tax

The personal income tax in Sweden consists of two parts, a flat rate local income tax and a progressive central government income tax. Local and national income taxes are assessed on similiar bases. Prior to the tax reform of 1971, however, local income tax payments were deductible from the base of the national income tax.

An important feature of the reform of 1971 was the change from joint to individual taxation of spouses. Individual taxation applies to so called A-income, that is, income from wages and salaries, farms and unincorporated businesses. Income from other sources, for example investment income, which is labeled B-income, is, however, still taxed on a joint basis if in excess of a certain amount (presently 2,000 Swedish crowns (SEK)).

For the calculations of taxable income several kinds of deductions may be made. First, all individuals are entitled to a basic deduction. During the second half of the 1970s this deduction amounted to 4,500 SEK, but the rules have recently been changed. The basic deduction is now confined to local income taxation, and the amount has been raised to 6,000 SEK. Households with children are entitled to an "employment deduction", which means that the secondary worker of the family may deduct 25 percent of his/her earned income up to a maximum of 2,000 SEK. Single persons with children are allowed the same deduction. We note, finally, a minor remnant of the old system of joint taxation of spouses. A household with only one income earner is granted a credit against the income tax liability of 1,800 SEK.

As already pointed out, investment income in Sweden is regarded as B-income and is taxed on a joint basis if in excess of 2,000 SEK. B-income is added to the income of the primary (highest) income earner and taxed according to her or his marginal rate of income tax. (Note, however, that the first 4,500 SEK of income of each spouse are treated as A-income, regardless of source. As explained, A-income is taxed on an individual basis.)

Swedish tax laws exempt a limited amount of investment income from tax. In 1980, this tax free amount was 1,600 SEK for a married couple and 800 SEK for single persons. Apart from this, the tax rules are symmetric in the sense that interest payments are deductible with no upper limit. As a result of the tax reform due to be implemented by 1985, this principle of symmetry will be broken for high income earners. Technically this will be accomplished by dividing the national income tax into two parts, the basic tax and the supplementary tax. The tax base for the basic tax will be determined

44

according to existing rules which include in the base net investment income and net income from homeownership (usually a negative amount after deductions for mortgage interest). The marginal tax rate rises to a maximum of 20 percent at an income of 64,000 SEK in 1981 prices. The base of the supplementary tax is defined differently in one important respect, namely that *negative* net investment income and *negative* income from home-ownership may not be used as an offset against wage income. The marginal tax rates for the supplementary tax run from zero at 102,400 SEK to a maximum of 30 percent at 288,000 SEK (in 1981 prices).

During the last few years, the tax base has been further eroded by some concessions to specific forms of household savings. Savings on special bank accounts (with an upper annual limit of 4,800 SEK) and special funds for shares (with an annual maximum of 7,200 SEK) are granted a tax free return over a five year period. The annual savings under this scheme are furthermore entitled to a credit against income tax liability amounting to 20 percent for bank account savings and 30 percent for savings put into the special funds for shares.

Another recent change was the introduction of a temporary scheme to reduce the tax burden on dividends. Starting in 1981, and pending a possible introduction of an imputation system, shareholders are allowed a credit against their income tax liabilities of 30 percent of dividends received. This credit, however, may not exceed 4,500 SEK for a married couple (2,250 SEK for single persons).

Capital gains are taxed in Sweden, although only upon realization. A fraction of capital gains is included in the income tax base. For long-term gains the inclusion rate ranges from zero on personal property to 100 percent on real estate, and for financial assets, such as shares, it is 40 percent (further details may be found in Section 2.8 below).

Over the last decade there has been a growing concern in Sweden about the efficiency effects of the present system of taxing capital income. There is a widespread belief that the tax system diverts savings into "unproductive" investments such as art, antiques, gold and consumer durables, at the expense of financial assets, such as bank accounts and corporate securities, which are used to channel savings into business investment in fixed capital. Residential investment in owner-occupied housing and summer cottages is also favored by the tax system. Owner-occupied housing provides a noteworthy exception to the general principle of taxing only realized income. Home ownership – including summer cottages – in Sweden is taxed on imputed income at a rate of two percent (with higher rates on more expensive houses) on the tax assessed value of the house. This imputed income is included in the income tax base of the owner. The tax assessed values are approximately 75 percent of the market values at the time they are set and the assessments are changed at an interval of about 5 years. Mortgage interest is fully deductible in computing the personal income tax base. Real capital

gains on housing (defined by indexing the acquisition cost) are taxed upon realization with an inclusion rate of 100 percent. New rules enacted in 1981 imply a partial departure from the principle of taxing real capital gains by disallowing indexation of the acquisition cost for the first four years of ownership.

For more than a decade, the national income tax schedules have been changed almost annually. Since 1979 these revisions have been based on changes in the consumer price index. It would, however, be wrong to conclude that personal income taxation in Sweden is fully indexed. The basic deductions and allowances described above are all defined as fixed nominal amounts, and changes in these deductions and allowances have been implemented only on an *ad hoc* basis. Moreover, the taxation of capital income is unindexed and tax is charged on nominal capital gains (except for housing) and nominal interest receipts.

The income tax schedule in Sweden is highly progressive. The degree of progressivity may be expressed in terms of the elasticity of net of tax income (the percentage change in post-tax income resulting from a one percent change in pre-tax income). With a proportional tax schedule the elasticity is unity, whereas under a progressive tax system it is less than unity. During the 1950s and 60's, the elasticity was around 0.8 for the largest groups of wage earners and varied little between different income levels. As a result of the major tax reform of 1971, progressivity was increased, however, and since the beginning of the 1970's the elasticity has been around 0.6.

Figure 4.1 shows marginal and average tax rates and elasticities of post-tax income for different levels of pre-tax income in 1979. The income distribution curve shows the fraction (in percent) of the total number of income earners located in income brackets with an average income of no less than the indicated amount.

2.2 The Corporate Tax System

The corporate form is by far the most important legal form of enterprise in Sweden. Table 4.2, which is based on a special investigation carried out for this study by the Swedish Central Bureau of Statistics (SCB), shows the share of sales originating from corporations in several industry groups. The proportion of total sales originating from corporations in 1979 is less than 90 percent only for wholesale and retail trade. This industry group also exhibits large shares of partnerships and so called economic associations (a cooperative form of enterprise).

Corporations pay both local and national income tax. The national income tax at present amounts to 40 percent of taxable profits. The local income tax varies between different communities, averaging about 29 percent in 1980. Local income tax payments are deductible (with one year's lag) from the

46

FIGURE 4-1

INCOME TAX STRUCTURE IN SWEDEN

MARGINAL RATE

AVERAGE RATE

NET INCOME
ELASTICITY

INCOME
DISTRIBUTION

INCOME IN 1,000 Skr

TAX RATE (IN PERCENT) OR SHARE OF INCOME EARNERS

47
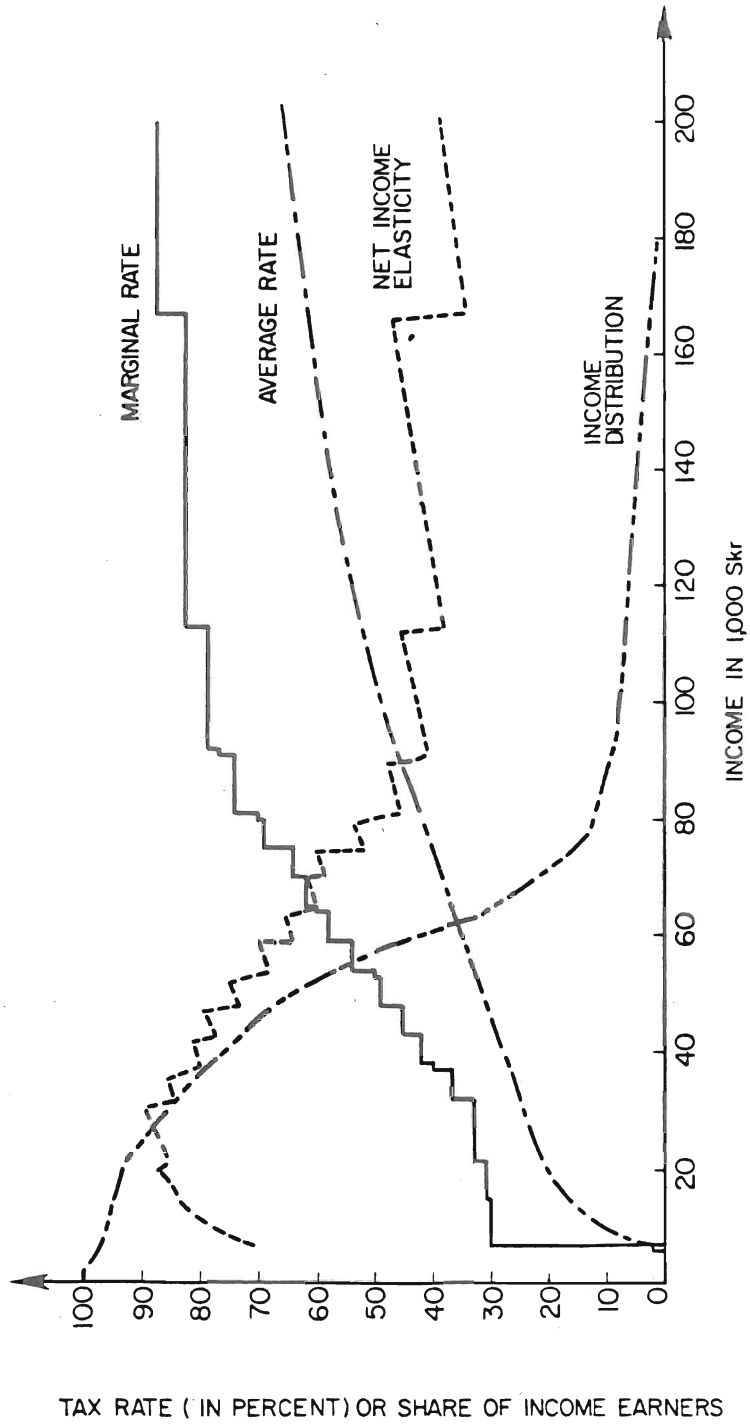
Table 4.2 *Corporate Share of Total Sales in each Industry, 1979 (percent)*

Industry	All Corporations	Privately owned Corporations
Manufacturing	92	84
Electricity, Gas, Water	95	40
Building and Construction	98	96
Wholesale and Retail Trade	77	70
Transportation	92	82
Private Services[a]	91	78
Total	86	78

Source: Central Bureau of Statistics (SCB).
[a] Only part of private services are included.

national tax assessment, making the total statutory tax burden on corporate net profits approximately 57 percent. This statutory tax rate is used in Section 2.5 to compute the parameter value for τ, the tax rate on corporate profits. As will be explained, its value depends also on the rules for the investment funds system, allowing firms to deduct up to 50 percent of their profits.

The Swedish corporate income tax may be described as a classical system of company taxation. Corporations pay a flat rate of tax on all taxable profits, and the shareholders in their turn are liable to income tax on dividends. Since the early 1960s, however, some mitigation of the double taxation of dividends has been offered at the firm level through the so called Annell legislation.

According to the rules in force in 1980, firms are allowed to deduct against current profits dividends on newly issued shares for a maximum period of 20 years following a new share issue. The sum of deductions taken may not exceed the amount raised by the issue, and the annual deduction is further restricted to a maximum of 10 percent of the issue. The Annell-rules in force in 1970 were less generous than in 1980, allowing a maximum deduction of 5 percent for 10 years. No mitigation of double taxation was offered in 1960.

Formally, this can be described in the following way. Let h be the rate Annell-deduction per dollar of new issue and assume this deduction to be taken for ω years ($h\omega = 1$). Annual tax savings are τh, and the present discounted value of the tax savings will then be

$$\tau h \int_0^\omega e^{-\varrho u} du = \frac{\tau h}{\varrho}[1 - e^{-\varrho \omega}],$$ (4.1)

where ϱ is to be the firm's discount rate.

It is important to note that this expression is the present value of tax saved per dollar of new issues. In order to incorporate the Annell-deduction into

48

the theoretical framework of our study, it must be transformed into an equivalent tax saving per dollar of gross investment. This necessitates a rather formal treatment which is relegated to Appendix C. We show there that the economic effect of the Annell-deduction may be modeled by adding, in the case of new share issues, an additional term to the expression for A (the present value for tax allowances) reflecting the value of the deduction. This is given in equation (C.5) of the appendix. When the Annell-deduction is incorporated in this way the value of θ ("the opportunity cost of retained earnings in terms of dividends foregone") is set equal to unity.

2.3 Tax Allowances for Depreciation and Inventories

The effective tax burden on corporate profits depends upon the rules governing the valuation of inventories and the depreciation allowances for fixed assets. Firms are required to value inventories at the lower of the acquisition cost or market value, and this means that profits for tax purposes are calculated according to the principle of "first in – first out". As an offset to this, a deduction is allowed up to a maximum of 60 percent of the value of purchases of inventories. This main rule is *inter alia* supplemented by an additional rule ("Supplementary Rule I") that makes it possible for firms reducing their inventories to base inventory writedown on the average size of inventories for the past two years.

Construction firms receive a special tax treatment for that part of their inventories which consists of buildings either not yet or only recently completed. On assets of this kind, inventory writedown is limited to approximately 15 percent.

The Swedish rules for taxing inventories imply that $v = 1$ for all industry groups, and $f_2 = 0.6$ for inventories in Manufacturing and Commerce. For Other industry (which includes construction) the weighted average value for f_2 is 0.193.

The rules of inventory writedown described above were supplemented in 1980 by a scheme which allowed firms to defer corporate taxes by making allocations to a "profits equilization fund". The seize of the fund is limited to 20 percent of the firm's total wage costs and the amount allocated for one year is included with taxable income for the following year, unless offset by a new allocation. If use is made of this scheme, regular inventory writedown is limited to 45 percent as compared to the normal 60 percent.

The stated motive for the introduction of this new scheme in 1980 was to give firms with either no or limited inventories an opportunity to defer corporate taxes. Judging from the empirical investigations carried out by the Government Committee on Business Taxation in the mid 1970s, and by Rundfelt (1982), it seems clear, however, that for the three industry groups included in this study, the "representative" firm has continued to use the

49

regular rules of inventory writedown rather than the new scheme. The rules of the "profits equilization fund" have therefore not been taken into account for our calculations.

As far as machinery and equipment are concerned, the acquisition cost may be depreciated for tax purposes at a rate of 30 percent per annum on a declining balance basis (the "30-rule"). This means that $f_2 = a = 0.3$, since the first allowances may be taken in the year of acquisition, and $f_1 = 1 - f_2 = 0.7$, in terms of the notation of Chapter 2. At any time, though, firms have an option to choose instead – for the entire stock of machines –the accounting value that would result from a 5 years' straight-line depreciation. In other words, a firm is free to write off an amount needed to bring the remaining value down to what it would have been, had the firm from the outset written off 20 percent of the original amount invested. For a *single* investment it is profitable to switch to the "20-rule" after the third year. A growing firm, however, with many young vintages of capital, would always stick to the "30-rule". Our assumptions about f_2 and a for investments in machinery, therefore, may be thought of as applying to such a firm.

Fiscal depreciation of buildings is generally carried out on a straight-line basis. The lifetime for tax purposes varies between buildings of different type and of different use, according to special guidelines issued by the tax authorities. A comparison between these guidelines and the actual composition of investments in buildings – as reflected in the calculations of capital stocks carried out by the Swedish Central Bureau of Statistics (see Section 2.4) indicates that buildings within the Manufacturing industry are typically written off using a lifetime of 28 years, as compared with 33 years for Other industry and 36 years for Commerce. Buildings completed since 1970, however, are treated more favorably. During the first 5 years, firms are allowed to deduct an additional 2 percent per year, which shortens the tax lifetime of the asset.

The rules of tax depreciation for buildings may be expressed in terms of the present discounted value of depreciation allowances A_z which is given by

$$A_z = 0.02 + \frac{1}{L} + (0.02 + \frac{1}{L}) \int_0^4 e^{-\varrho u} du + \frac{1}{L} \int_4^n e^{-\varrho u} du, \tag{4.2}$$

where L is the tax lifetime.

The first term of this expression reflects the fact that the first allowances may be taken in the year of acquisition. Depreciation is carried out for n years, where n is determined so as to make the sum of all allowances equal to the acquisition cost:

$$0.02 + \frac{1}{L} + 4(0.02 + \frac{1}{L}) + (n-4)\frac{1}{L} = 1 \tag{4.3}$$

This gives n = 0.9L–1 for use in the calculations. Before 1970 no "primary deductions" were allowed, and the period of fiscal depreciation was therefore n = L–1.

50

2.4 Estimates of Economic Depreciation

It is generally believed that the Swedish rules of fiscal depreciation are generous – at least in times of stable prices – allowing firms to defer corporate tax payments. The extent of accelerated write off is, however, difficult to determine due to lack of reliable studies on rates of economic depreciation.

The most ambitious attempt to calculate economic depreciation in Sweden is that of the Swedish Central Bureau of Statistics (SCB), and our assumptions about rates of economic depreciation correspond to those implicitly used by the SCB. The purpose of this section is to describe the rather complicated procedure employed by the SCB in estimating net capital stocks and economic depreciation. The implied rates of economic depreciation are shown in Table 4.3.

For each specific category of asset for which capital stocks are estimated – a machine of a certain type used in a certain industry – the SCB assigns a time pattern, according to which the assets of a given cohort are retired from service, and an assumed mean value for the age at which the asset is retired. The retirement patterns have been obtained from the set of survivor curves estimated by Winfrey (1935) for the U.S. during the 1930s, whereas the assumptions on average retirement age are based on a number of Swedish sources. The main source for the assumptions on average retirement age is Wallander (1962).

The Winfrey survivor curves combined with the SCB assumptions on average retirement age form the basis for perpetual-inventory estimates of gross capital stocks. These estimates of gross capital stocks can be thought of as implying a "sudden death" assumption for each single asset, which means that an asset maintains full productive efficiency until the moment it is retired. The time of retirement varies among the different assets of a vintage, however, as reflected by the survivor curve.

The SCB also provides estimates of economic depreciation based on (unpublished) calculations of net capital stocks. Net capital stocks are calculated by adjusting the gross capital stocks to allow for the fact that the *value* of an asset declines by age as it approaches the age of retirement. The approach chosen by the SCB for this purpose can be explained in the following way. Assume that a cohort of assets of a given vintage originally consists of N machines, each of unit value. The number of machines remaining in service after u years is then $S(u)N$, where $S(u)$ represents the "normalized" survivor curve which takes the value of unity for a new vintage. At time u, $-\dot{S}(u)N$ machines are retired from service. The average retirement age of the assets of this cohort is therefore

$$d(0) = \frac{1}{S(0)N} \int_0^\omega -u\, \dot{S}(u)N\, du, \qquad (4.4)$$

where ω represents the maximum age of the cohorts (implying that $S(\omega) = 0$). For those assets, which still remain in service after n years (at time u=n), the average age of retirement is

$$d(n) = \frac{1}{S(n)N} \int_n^\omega -u\dot{S}(u)N \, du. \tag{4.5}$$

The average expected remaining life of the assets surviving after n years is, therefore, $d(n)-n$.

Now, the SCB simply assumes that an asset still in service after n years retains a fraction f(n) of its original value, equal to the ratio between the average expected remaining life $[d(n)-n]$ and the average total expected life $d(n)$:

$$f(n) = \frac{d(n)-n}{d(n)}. \tag{4.6}$$

The 'valuation coefficient' f(n) takes the value unity for a new vintage (n=0) and declines to zero at the maximum age of the cohort (n=ω). By multiplying f(n) by the number of assets surviving, the SCB obtains a value age profile (n=0,...,ω) for a cohort of assets of a given vintage.

$$b(n) = S(n)Nf(n), \quad n=0,\ldots, \omega. \tag{4.7}$$

For manufacturing industry, the most frequently used survivor curve for macinery (the Winfrey S_1 curve) has an assumed average retirement age of 25 years. The corresponding b(n) curve is then almost linear for the first one third of the maximum life and approximately geometric for the remaining two thirds.

This approach forms the basis for perpetual-inventory estimates of net capital stocks. Economic depreciation is then obtained as the difference between gross investment and the change in the net capital stock. To determine the actual rates of depreciation implicit in the calculations performed by the SCB, we have related economic depreciation, D, to the corresponding values of the net capital stocks, K. (Data on net capital stocks are not published by the SCB. Our calculations on rates of economic depreciation are therefore based on unpublished tables at the 4-digit level, obtained directly from the SCB.) We define the rate of economic depreciation to be

$$\delta_u = \frac{D_u}{K_u} \tag{4.8}$$

The parameter δ_u combines the effects of retirement from service (assuming no in-place loss of efficiency) and decline in value as assets approach the time of retirement. Our calculations, covering a thirty year

52

Table 4.3 *Rates of Economic Depreciation (percent)*

	Manufacturing	Other Industry	Commerce
Machinery[a]	7.7	19.7	18.2
Equipment	7.1	12.2[c]	11.7
Vehicles	46.7	37.0	40.3
Buildings	2.6	2.3	1.8
Total[b]	5.4	7.1	7.7

Source: Own calculations based on estimates of economic depreciation and net capital stocks of the Central Bureau of Statistics (SCB).

[a] Machinery is a weighted average of equipment and vehicles in each industry.

[b] The row for total is a weighted average of machinery and buildings in each industry.

[c] The major explanation for this rather high figure is the fast depreciation of equipment in the Building and Construction sector (one third of all equipment in Other Industry). The average depreciation rate for this kind of asset is nearly 22 percent (drilling machines, grinding machines, cementmixers, bulldozers, and similar heavy equipment subjected to very rough usage).

period ending in 1979, indicate a remarkable constancy of the implicit δ_u.

The degree of constancy is particularly striking for buildings, with practically no variation at all over time. As a good approximation, therefore, the SCB estimates of economic depreciation are equivalent to estimates based on the simple case of geometric depreciation with a constant δ.

Our estimated depreciation rates are shown in Table 4.3. These are an average of the implicit rates described above for the years 1970-79. The marked differences between the industry groups in the depreciation rates for machinery are largely explained by the different proportions of rapidly depreciating vehicles.

It is interesting to compare the estimates with the results of a recent survey carried out by IUI and the Federation of Swedish Industries (Wallmark, 1978). According to this survey, manufacturing firms estimated the average length of life of newly installed machinery as 14.3 years, and of new buildings as 28.7 years. The exact meaning of these answers is unclear. Assuming, however, the pattern of depreciation to be geometric, which implies that the average length of life is the inverse of the rate of depreciation, these numbers may be interpreted as average rates of depreciation of 7.0 and 3.5 percent, respectively. These rates are not far from those implicit in the SCB estimates of economic depreciation for Manufacturing.

2.5 Investment Grants and Incentives

An important feature of the Swedish corporate income tax is the investment funds system (IF). The idea behind the system is to induce firms to reserve profits during boom years to be used for investment purposes during

subsequent recessions. The IF system was introduced in 1938 but did not gain importance until 1955 when the rules were changed. In that year firms started to make tax free allocations to investment funds, and in the 1958 recession funds were released for the first time. Since then, releases of investment funds have been more and more frequent. In particular, the efforts during the 1970s to promote industrial growth meant that firms were able to use the IF system almost continuously for new investment. Since the mid-1960s the IF system has also been used extensively for regional policy purposes.

The investment funds system works as follows. Each year a firm can deduct up to 50 percent of its tax profits by "allocating" an equivalent amount to its investment fund (appearing as an entry on the balance sheet). Since the IF allocation takes the form of a deduction against taxable profits, tax payments are reduced by an amount equal to the allocation times the (statutory) corporate tax. However, 50 percent of the allocation must be deposited interest free at the Central Bank (while the remainder may be used for any purposes). Hence, even if the funds are never used again, IF allocations provide an attractive alternative to paying profits tax: 50 percent is paid to the Central Bank rather than 57 percent to the government as profits tax.

When the investment funds are released, for example during a recession, firms are allowed to withdraw from the Central Bank deposits corresponding to 50 percent of the cost of investments considered to be financed by the IF. Depending on the rules set up for a particular release, firms are sometimes also granted an extra investment allowance in the tax assessment amounting to 10 percent of the IF used. (This refers to a so called 9:1 release that was in effect at the end of the 1970s and beginning of 1980s.) Investments financed by IF, on the other hand, are considered to be fully written off for tax purposes. Firms lose, therefore, the possibility of deducting fiscal depreciation.

As pointed out, the IF system was put to extensive use during the 1970s. Available data indicate, though, that the firms in the industry groups included in our study financed less than 20 percent of their investments by investment funds. It seems reasonable to assume, therefore, that the *marginal* investment considered for this study must be written off according to the regular rules of fiscal depreciation rather than through the IF system.

This view does not imply, however, that the profitability of the marginal investment is unaffected by the IF-system. As explained, Swedish corporations are allowed to reduce the income tax base by allocating 50 percent of taxable profits to an IF. This means that up to 50 percent of the profits from the marginal investment will be taxed at the statutory corporate tax rate of 57 percent, while remaining 50 percent will be untaxed. There is, however, an implicit cost to the firm of the allocation and this cost equals the interest foregone on the 50 percent of the allocation which must be deposited with the Central Bank plus the increased tax payments due to the loss of regular

54

depreciation allowances on assets financed by the IF.

By this line of argument, it seems reasonable to define the *effective* corporate tax rate τ to be used for our model calculations, as a weighted average of the statutory tax rate τ_s (which is 57 percent in 1980) and the implicit cost of the IF-allocation. To put the expression for the effective corporate tax rate in a general form, we may introduce the following notation: Let l be the proportion of profits which may be allocated to the IF and b be the proportion thereof that must be deposited with the Central Bank. The IF-allocation is used after n years at which time the firm can withdraw the Central Bank deposit. The effective corporate tax rate then becomes

$$\tau = (1-l)\tau_s + bl\ (1-e^{-\varrho n}) + lA_d\ e^{-\varrho n}\ , \tag{4.9}$$

where τ_s is the statutory corporate tax rate and ϱ the firm's after tax rate of discount (which depends on the source of finance). The second term of the equation then represents the present value of the interest foregone on the Central Bank deposit and the third term the present value of increased tax payments due to foregone depreciation allowances.

During the second half of the 1970s and the beginning of the 1980s, firms were allowed to use the IF-system almost continuously for new investment. For 1980, it seems reasonable, therefore, to assume a zero time lag between allocation and use of the IF (n = 0). The cost to firms of IF-allocations would then be limited to the loss of regular depreciation allowances on the acquired assets. In this case, equation (4.9) simplifies to

$$\tau = (1-l)\tau_s + lA_d. \tag{4.10}$$

Both 1960 and 1980 represent peak years of the business cycle, and with a length of the cycle of four to five years, firms would expect a time lag of about two years before the IF-allocations could be used. We assume, therefore, n = 2 for 1960 and 1970. The details of the IF-system given above imply, furthermore, that l has a value of 0.5 for 1980. For 1960 and 1970 l equals 0.4. In 1980, 50 percent of an IF-allocation must be deposited with the Central Bank, which means that b equals 0.5. For 1960 and 1970 b takes the value 0.46.

Considering that the present discounted value of regular depreciation allowances per unit of investment is lower for buildings than for machinery, it seems reasonable to assume that a tax minimizing firm would use its investment funds for investments in buildings rather than machinery. This assumption will be used here, and the definition of A_d in equation (4.9) is therefore (see Section 2.3):

$$A_d = \tau\ [0.02 + \frac{1}{L} + (0.02 + \frac{1}{L}) \int_0^4 e^{-\varrho u}du + \frac{1}{L} \int_4^{0.9L-1} e^{-\varrho u}du]. \tag{4.11}$$

55

The effective corporate tax rate τ, as defined by (4.9), is a function of the firm's after tax discount rate ϱ and this means that it depends on the source of finance used in connection with future IF-releases. However, in order to reduce the programming work involved for our numerical estimates, we use the same parameter value for τ for all sources of finance. This value is computed by using for ϱ a weighted average of ϱ (as obtained for the "fixed-r" case) for each source of finance. The weights correspond to the 1980 proportions of debt, new share issues and retained earnings for the three industry groups aggregated. This procedure makes it possible, in turn, to approximate equation (4.9) by a linear function of the inflation rate (π). This means that $\tau = 0.449 - 1.06\pi$ for 1980 and $\tau = 0.410 - 0.41\pi$ and $\tau = 0.454 - 0.49\pi$ for 1960 and 1970, respectively. At 9.4 percent inflation, which is the rate of inflation actually experienced in Sweden over 1971–80, the effective corporate tax rate τ is therefore 34.9 percent, as compared to the statutory corporate tax rate (τ_s) of 57 percent. For 1960 and 1970, statutory corporate tax rates were 49 and 53 percent, and (at the same inflation rate) effective corporate tax rates were 37 and 41 percent, respectively.

On occasions there have been special and temporary improvements of depreciation and special tax reductions to stimulate investment. These types of stimuli appear to have been used more frequently in recent years. Thus, in 1976-78 firms were offered an extra investment allowance of 25 percent for machinery and equipment, for national income tax purposes. Regular fiscal depreciation rules were not affected by this extra allowance. This investment allowance was reintroduced in 1980, and the rate was then set to 20 percent for both the local and national tax assessments. A 10 percent allowance was granted for buildings. With a statutory corporate tax rate of 57 percent, these investment allowances are equivalent to investment grants of 11.4 percent and 5.7 percent for machinery and buildings, respectively. We assume, therefore, $f_3 = 1$ and $g = 0.114$ for machinery, and $f_3 = 1$ and $g = 0.057$ for buildings.

In addition to the grants and tax allowances discussed above, large subsidies were extended to manufacturing firms following the recession of the late 1970s. These were provided on an *ad hoc* basis and were, to a large extent, provided in the form of rescue operations to maintain employment. The magnitude of payments is discussed below in Section 4.4. For this reason we have not included such subsidies in our calculations, and have restricted attention to statutory rates of allowances and grants.

The general sales tax that was in effect in Sweden between 1959 and 1969 included in its base gross investments. Tax payments were deductible against the corporation income tax base. In 1960, the general sales tax was levied at the rate of 4 percent, and the corporate tax rate was 49 percent. Therefore, the sales tax was equivalent to a *negative* investment grant of 2 percent ($f_3 = 1$ and $g = -0.02$ in 1960).

56

2.6 Local Taxes

The local income tax in Sweden applies not only to individuals but also to corporations. The tax on individuals was discussed in Section 2.1. The base of the corporate tax – which is similar to that of the national corporation income tax – is defined by the central government, while the rates are determined by the local authorities. The same rate is applied to companies as to individuals. In 1980 the countrywide average was 29 percent.

A Swedish corporation is not liable for property taxes, as usually defined. It may be noted, however, that for local income tax purposes, a firm must declare an amount corresponding to 2 percent of the assessed value of its buildings and real estate. This so-called "guarantee amount" is deductible from profits for the local income tax assessment, but taxable income cannot fall below the guarantee amount. The effect of this is to levy a minimum tax on firms equal to the product of the tax rate and 2 percent of the value of its real estate. We have ignored this provision (which is not relevant to marginal investment in machinery and inventories) and assumed that firms investing in buildings have taxable profits in excess of the guarantee amount.

2.7 Wealth Taxes

The Swedish wealth tax applies to individuals only. Capital values of insurance policies and individually acquired pension rights are excluded from the tax base. The 1980 schedule (unchanged since 1975) levied a zero tax rate on net wealth (assets less liabilities) below 200,000 SEK, a 1 percent rate on wealth between 200,000 and 275,000, 1.5 percent between 275,000 and 400,000, 2 percent between 400,000 and 1,000,000 and 2.5 percent on wealth exceeding 1,000,000 SEK.

A detailed description of the distribution of household wealth in Sweden for 1975 is presented in Spånt (1979), and this study makes it possible to estimate the marginal wealth tax rates implied by a hypothetical 1 percent increase in household wealth. Spånt shows the holdings of various assets, such as real estate, bank accounts and shares for 13 different classes of taxable net wealth. Using this information and the marginal tax rates for each class of net wealth, as implied by the tax schedule, separate estimates of the weighted average marginal tax rates on the holdings of equity and debt have been obtained. For 1975, the marginal wealth tax rate on equity turned out to be 1.5 percent, as compared to 0.4 percent on bank account holdings. Since there is almost no direct lending (through bonds, for example) from households to the business sector, the tax rate on bank account holdings has been used as our estimate of the marginal wealth tax rate on debt.

The different marginal tax rates on equity and debt obviously reflect the differences in the distributions of the holdings of shares and bank accounts

among households. Wealthy households have invested a larger proportion of their net wealth in shares than have relatively less wealthy households. An additional indication of this fact is that 35 percent of the total amount of shares owned by households are held by households paying the top marginal wealth tax rate, whereas for bank account holdings the corresponding figure is barely 4 percent. On the other hand, households with taxable net wealth below the tax exempt limit own 10 percent of household shareholdings and 26 percent of total bankholdings.

With an average rate of inflation of nearly 10 percent since the mid 1970s it is reasonable to expect the marginal wealth tax rates to be higher in 1980 than in 1975. Assuming the average net wealth within each wealth class to increase at the rate of inflation and the relative distributions of bank accounts and shareholdings to be unchanged, we have estimated that the marginal tax rate on equity actually rose from 1.5 percent in 1975 to 1.9 percent in 1980, compared with an increase from 0.4 to 0.8 percent on debt.

The wealth tax schedule, which was introduced in 1975 and still in force in 1980, was changed in 1981. This revision reduced the estimated marginal tax rates to their 1975 level. Because the revision of the schedule in 1981 effectively reestablished the marginal tax rates of 1975, we have chosen as our estimates for 1980, the average of the 1975 values (which equal the 1981 values) and 1980 values. The assumed marginal wealth tax rate is therefore 1.7 percent on equity and 0.6 percent on debt.

2.8 Household Tax Rates

Average marginal income tax rates on investment income of households are shown in Table 4.4 for the years 1960, 1970, 1980, and for the proposals due to be implemented in full by 1985.

Table 4.4 *Average Marginal Income Rates (m) and Statutory Capital Gains Tax Rates (z_s) of Household Investors*

	m		z_s
	Debt	Equity	
1. 1980	52.2	65.2	26.1
2. 1980[a]	49.9	64.0	25.8
3. 1970	48.0	58.0	15.0
4. 1960	34.0	45.0	0
5. "New Rules" 1985	43.9	57.2	22.9

Source: Own calculations as described in the text.
[a] With the exemption limit for investment income taken into account.

58

The figures for 1980 are based on a special investigation carried out for this study by the Swedish Central Bureau of Statistics (SCB). Since the mid 1970s the SCB has collected detailed information on household income based on a sample survey of tax returns and other sources. This data base (HINK), which consists of approximately 28 thousand individuals from a population of 8.2 million, has been used to estimate the relative distributions of dividends and interest receipts over different income brackets in 1978. (The Swedish term for the income concept used is "sammanräknad nettoinkomst".) To obtain reliable estimates, it has been necessary, furthermore, to combine the regular HINK data base with a supplementary sample of wealthy households. This supplementary sample was not available for 1979 and 1980.

Since the basic data were available only for 1978, we have assumed that the "real" distributions (that is, adjusted for changes in the price level) of dividends and interest receipts were the same in 1978 and 1980. The average incomes of each of the 19 income classes employed in 1978 were translated into corresponding nominal amounts for 1980. Marginal tax rates for the different levels of income were obtained from the IUI Model of the System of Personal Income Taxation (see Jakobsson-Normann, 1974). The marginal tax rates were then weighted together to obtain average marginal tax rates.

The first row of Table 4.4 shows the weighted average marginal income tax rates for households, which receive dividends and interest income, respectively. These numbers may, however, exaggerate the tax burden on a marginal increase of investment income since all households are allowed a limited amount of investment income free of tax (see Section 2.1 above). We have, therefore, also calculated the share of dividends and interest receipts, respectively, going to households whose *net* investment income (dividends, interest receipts, etc. *less* interest costs) exceeds the maximum tax free amount. The adjusted tax rates obtained by multiplying these shares by the corresponding marginal tax rates for each income bracket then reflect the fact that some households do not pay any tax on marginal increases in investment income. As shown by the second row of the table, these calculations reduce the weighted average marginal tax rates by 2 and 1 percentage points, respectively.

For purposes of comparison, Table 4.4 includes also estimates of average marginal tax rates for 1970 and 1960. The estimates are based on own calculations using a 1966 study of the distributions of ownership of shares and bank account holdings over different income brackets (Kapitalbeskattningen, 1969). These distributions were used, in turn, as proxies for the distributions of dividends and interest receipts, respectively.

The calculations assume that the real distributions of dividends and interest receipts over income class were the same in 1960 and 1970 as in the year of the study, 1966. The mean incomes for the income classes employed in the 1966 study were translated into corresponding nominal amounts for

59

1960 and 1970, using tax assessment statistics. As for 1980, marginal tax rates were obtained from the IUI tax model.

Table 4.4 shows the statutory marginal tax rates on realized capital gains on shares. Taxation of long-term capital gains on shares was first introduced in Sweden in 1966 (see Rundfelt, 1982). According to the rules in force in 1970, 10 percent of the proceeds of the *sale* of shares were included in the personal income tax base of the seller.

Assuming that investors expect capital gains to accrue at the nominal rate of 5 percent per annum (the average increase in the stock market index at the time) and assuming a holding period of 10 years, this "sales tax" is equivalent to a statutory rate of tax on realized capital gains of 15 percent. The rules were then changed in the mid 1970s to define a tax on realized nominal capital gains. The new rules require that 40 percent of realized long-term nominal gains (in excess of a tax free amount of 3 000 SEK) be included in the taxable income of the owner. This means that, at the margin, the capital gains tax rate equals 40 percent of the income tax rate. Long-term gains are those on assets held for more than two years. Short-term capital gains on assets held for less than 2 years are fully taxed as income.

Finally, the fifth row of Table 4.4 shows marginal income tax rates for the tax reform due in 1985 but introduced into legislation in June 1982. The figures shown are the tax rates that would have applied had the reform been in full effect in 1980. The rules of the 1985 system have not been incorporated into the IUI Tax Model, and the numbers reported are therefore of an approximate nature. In addition, the 1985 tax system poses special problems because of the division of the national income tax into a basic tax and a supplementary tax. For the supplementary tax, *negative* income from financial investments and home ownership (underskottsavdrag) may not be used as an offset to wage income, and available information on the distribution over income class of this negative income is not fully comparable with the data used for Table 4.4.

Chapter 2 of this book (as well as the country chapters for the U.K. and the U.S.) discusses in some detail the problems posed by the fact that households may hold debt instruments in a non-interest bearing form (such as sight deposits). It is assumed that non-interest bearing accounts yield a return in the form of bank services provided free of charge. Income from non-interest bearing deposits is therefore deemed to be taxed at a zero rate. This implies, in turn, that the marginal tax rate on income from debt instruments must be calculated as a weighted average of the ordinary marginal tax rate (as shown in Table 4.4) and the zero rate on non-interest bearing deposits.

Household holdings of non-interest bearing debt instruments are much less important in Sweden than is the case in other countries. Furthermore, Swedish households do, as a rule, earn interest income on sight deposits (such as checking accounts), albeit at a lower rate than on time deposits. Income accruing to sight deposits in Sweden, therefore, will be considered to

60

take the form of both interest income (which is taxed at ordinary tax rates) and untaxed bank services. According to our approximate calculations, the proportion of total household income on debt instruments accruing as untaxed bank services was only 1.4 percent, leaving 98.6 percent of total debt income in taxable form. The marginal tax rates of households applicable to debt finance are therefore equal to the tax rates appearing in Table 4.4 times 0.986. The 1980 marginal tax rate on interest earnings of 49.9 percent is then reduced to 49.2 percent, and the 1985 tax rate from 43.9 to 43.3 percent.

The numbers appearing in the second column of Table 4.4 represent the average marginal *income* tax rates of household equity investors. As will be explained below, it is important to distinguish between changes in the tax system that affect these marginal income tax rates and changes that affect the marginal tax burden on *dividends* alone. One reason for distinguishing between the two is illustrated by the operation of the 30 percent dividend tax credit scheme introduced in 1981. The tax credit (against personal income tax and therefore relevant only to households) applies only to the first 15,000 SEK of dividend income for a married couple (the limit is 7,500 SEK for a single person). The impact on marginal tax rates for dividends has therefore been estimated in a way similar to that used when calculating the effects of exempting from tax certain amounts of investment income. We have thus determined the share of a marginal increase in dividends in each income bracket that would qualify for the credit. According to these calculations, the new dividend tax credit did reduce the 1980 average marginal tax rate on dividends by 11 percentage points, from 64.0 to 53.0 percent. Alternatively, if the 1985 tax schedule had been in effect in 1980, the dividend tax credit system would have reduced the marginal tax burden on dividends from 57.2 to 47.3 percent.

As mentioned in Section 2.1, household taxation of investment income has also been affected by concessions to some special forms of savings – on special bank accounts and special funds for shares – introduced at the end of the 1970s. There is, unfortunately, no obvious way in which to translate the rules governing the so-called "tax-savings" schemes into single "tax rates" comparable to the marginal tax rates on regular forms of interest receipts or dividends. The numbers reported below thus reflect several somewhat arbitrary assumptions.

Consider an investor who puts one crown into a qualified special bank account. He immediately receives a credit against his income tax liability of 20 öre (20 percent), and no tax is charged on interest earnings provided that the crown – including compound interest – is kept in the account for a full 5 year period. After the required 5 year period, the account turns into a regular bank account with a taxable return. We shall assume, therefore, that the investor withdraws his money (amounting to e^{i5}, including compound interest) after 5 years. This assumption does not limit the time horizon of the "representative" investor to 5 years, however. As long as the annual

savings in the scheme are below the maximum sum allowed, the investment pattern described here may well be repeated any number of times. We may assume, therefore, that upon withdrawing the amount e^{i5} in year 5, the investor immediately returns one crown to the special bank account and receives an additional tax credit of 20 öre. The present value of the (negative) tax payments from repeating this procedure x times will then be

$$T = -0.2 \sum_{u=0}^{x} e^{-i(1-m)5u} \tag{4.12}$$

where 0.2 is the tax credit per crown of qualified savings, $i(1-m)$ is the after tax rate of discount of the "representative" investor, and u denotes time.

Now, imagine an alternative hypothetical arrangement where no initial tax credit is provided, but the investor has the option of paying tax (or rather, of receiving the subsidy involved) at the rate m^{SB} on his annual interest earnings from the special bank account. The same investment pattern is assumed, implying that the investor puts one crown into the account at time zero and then makes additional deposits between years zero and five to keep the same amount of money on the account as with the scheme described above. The investment is repeated x times and m^{SB} is set so as to yield the same present value of tax payments (subsidies),

$$[\int_{0}^{5} m^{SB} i e^{iu} \cdot e^{-i(1-m)u} du] \sum_{u=0}^{x} e^{-i(1-m)5u} = T , \tag{4.13}$$

where T is defined by equation (4.12) above. The expression under the integral sign of (4.13) is the present value of tax (subsidy) payments for each 5 year period, discounted to the beginning of each period. It is immediately clear from (4.12) and (4.13) that the holding period of the investor (denoted by the parameter x) does not affect m^{SB}.

Given the underlying assumptions, equations (4.12) and (4.13) can be used to obtain the value of the 'equivalent tax rate' m^{SB}. To an individual with a marginal tax rate (m) of 49.9 percent, the special bank savings scheme thus turns out to be equivalent to a tax of minus 3.3 percent on the annual return on the investment plan, assuming a market interest rate (i) of 15 percent. The value of 15 percent was chosen to be representative of nominal market rates at the time, although the equivalent tax rate is rather insensitive to changes in the assumed value for i.

The effects on household tax rates of the concessions to savings in the special funds for shares were estimated in a similar manner. There are presently seven funds in operation (six of which are run by banks) which acquire shares on the stock market. Savings channeled into these funds must be kept for five years and all dividends received by the funds must be reinvested. The individual is granted a credit against his income tax liability of 30 percent of his annual savings made under the scheme, and no taxes are charged on dividends and capital gains accruing within five years.

62

An immediate question here is whether the 30 percent tax credit granted by the scheme should be regarded as an offset to tax payments on dividends or on capital gains. We have settled this question by considering two funds. One of the funds is assumed to specialize in shares from corporations paying all their after tax profits as dividends. No capital gains are thus expected on the portfolio of this fund. The other fund acquires shares from corporations that retain all their profits. The return on the portfolio of this fund would then accrue as capital gains only.

On the basis of these two polar cases, the 'equivalent' tax rates on dividends and capital gains can be determined. Consider the first fund specializing in shares from corporations paying all their profits as dividends. Let the dividend yield on the portfolio of this fund be μ . Since all dividends are reinvested, one crown put into the fund at time zero will earn dividends of $\mu e^{\mu u}$ at time u . The "equivalent tax rate" m^{SF} may then be derived in exactly the same way as m^{SB} above, that is, from the equation

$$\int_0^5 m^{SF} \mu e^{\mu u} e^{-i(1-m)u} \, du = -0.3 , \tag{4.14}$$

where 0.3 is the tax credit per crown of savings in the special funds for shares. Assuming the pre-tax rate of discount and the return on the portfolio of the fund to be 15 percent ($i = 0.15, \mu = 0.15$) the "equivalent tax rate" m^{SF} would then be −4.7 percent for a "representative" equity investor with a marginal tax rate of 64 percent ($m = 0.64$, see Table 4.4).

The second fund, by assumption, specializes in corporate shares paying no dividends. Let the rate of growth in the value of the shares of this fund be β. At the end of the tax free 5 year period, therefore, the investor withdraws an amount $e^{\beta 5}$ per crown of initial savings. The "equivalent tax rate" z_s^{SF} may then be defined as the rate of tax (subsidy) that would yield the same present value of capital gains tax payment (subsidy) if applied to the conventionally defined capital gain of $e^{\beta 5} - 1$, as the 30 percent tax credit provided by the special funds scheme:

$$z_s^{SF} (e^{\beta 5} - 1) e^{-i(1-m)5} = -0.3 \tag{4.15}$$

Assuming $\beta = i = 0.15$, the "equivalent tax rate" z_s^{SF} is then −35.2 percent.

The tax savings schemes discussed here have not been taken into account for the 'standard case' estimates of effective tax rates for 1980 (presented in Section 4.1 below). We have chosen instead to consider the tax savings schemes as part of the "new 1981 rules", which include also the dividend tax credit system described above. This requires an assumption about the weight to be attached to the tax savings schemes in estimating household tax rates.

Both types of tax savings schemes were introduced in 1978 but interest was

initially largely confined to the special bank accounts. At the end of 1979, 8 percent of taxpayers participated and, of those, only one out of ten chose to put their savings into the special funds for shares. The average annual savings amounted to almost 70 percent of the maximum amounts allowed. During 1980, the rules of the special funds for shares were changed, increasing the initial tax credit from 20 to 30 percent and the maximum amount of qualified annual savings from 4,800 to 7,200 SEK. Following these changes, savings in the special funds for shares grew rapidly. By mid-1981, the participation rate for the two schemes together had risen to 15 percent of eligible taxpayers and, of those, almost 30 percent used the special funds for shares. Average annual savings still amounted to about 2/3 of the maximum sums allowed.

It is notable that households on average have not used the "tax savings" schemes to the maximum extent possible. It seems reasonable, therefore, to expect that an increase of household savings, of the kind assumed when defining the "margin" in this study, would be directed both through regular channels – e.g. bank accounts and the stock market – and through the "tax savings" schemes. With this view, an assumption must be made regarding the proportion of total household savings in banks that would be channeled through the special bank accounts, and the proportion of household equity investments that would be put into special funds for shares.

In mid-1981, the market value of the holdings of the special funds for shares amounted to approximately 3 percent of total household shareholdings. Holdings in the special bank accounts (including compound interest) were also about 3 percent of total household bank holdings. These numbers may give an unduly conservative picture of the importance of the "tax savings" schemes, however. Considering that the schemes were introduced as late as 1978, it seems more appropriate to use flow data. For 1981 the flow of deposits into special bank accounts amounted to 10 percent of the total increase in household bank holdings. As for the special funds for shares, by mid-1981, household deposits had risen to an annual rate corresponding to 6 percent of the total amount of equity capital obtained by the non-financial sector by way of new issues and (gross) retained earnings. These numbers, 10 and 6 percent, respectively, have been used as weights when determining the effects of the tax savings schemes on household marginal tax rates on interest income, dividends, and capital gains.

The "tax savings" scheme is therefore assumed to reduce the marginal tax rate on interest income from 49.2 to 44.0 percent (= $0.9 \times 0.492 + 0.1 \times (-0.033)$). As mentioned above, the 1981 dividend tax credit system alone effectively reduces the marginal tax rate on dividend receipts from 64.0 to 53.0 percent. Considering the special funds for shares, this marginal tax rate is further reduced to 49.5 percent ($0.94 \times 0.53 + 0.06 \times (-0.047)$). Similarly,

the capital gains tax rate is reduced from 26.1 percent to 22.4 percent (0.94 x 0.261 + 0.06 x (–0.352)).

As already pointed out, the reduction in the marginal tax rate on dividends (m_d) brought about by the dividends credit system and the "tax savings" scheme must be distinguished from a reduction in the statutory marginal income tax rate (m) of the equity investors. The expressions for the cost of capital with equity finance derived in Chapter 2 of this book assume the existence of a market for alternative financial investments where the nominal rate of return is taxed as income at the marginal rate of income tax (m). This after tax rate of return represents the rate of discount used for determining the cost of capital for equity financed corporate investments in fixed capital. Measures which only affect the taxation of corporate dividends, such as the Swedish dividend credit system, leave unaffected the rate of discount used by equity investors.

To incorporate the difference between the tax rates m and m_d, into the analytical framework set out in Chapter 2, consider a marginal investment in fixed capital of unit value financed by a new share issue at the beginning of a year. To simplify notation we will abstract from inflation, initial allowances, investment grants, etc., and assume that the rate of fiscal depreciation equals the rate of true economic depreciation, δ. The gross return on investment is MRR, which accrues at the end of the year. The firm then immediately sells the asset and repays the money put up by the shareholders at the beginning of the year. Assuming that the firm, by selling the asset, obtains an amount equal to the replacement value, $1–\delta$, there remains an amount

$$(MRR - \delta)(1 - \tau) \tag{4.16}$$

to be distributed to the shareholders as a dividend. This dividend is taxed at the marginal tax rate m_d, and, to make it worthwhile for the shareholders to participate in the new issue, the net dividend must equal the after tax return which the shareholder could obtain on alternative financial investments:

$$(MRR - \delta)(1 - \tau)(1 - m_d) = i(1 - m) , \tag{4.17}$$

where i is the investors' pre-tax opportunity cost of funds which we take to be the market interest rate. Hence

$$MRR = \frac{i(1 - m)}{(1 - \tau)(1 - m_d)} + \delta \tag{4.18}$$

The corresponding expression in Chapter 2 is

$$MRR = \frac{i}{(1 - \tau)\theta} + \delta \tag{4.19}$$

which implies that

$$\theta = \frac{1 - m_d}{1 - m} \qquad (4.20)$$

Prior to the introduction of the dividend credit system as part of the personal income tax in 1981, m_d was equal to m, and the "opportunity cost of retained earnings in terms of dividends foregone", θ, therefore, took the value of unity. The "new 1981 rules", which reduced m_d from 0.640 to 0.495, then raised the value of θ to 1.403. However, since the dividend credit system as well as the tax savings scheme applies to households only, θ still takes the value of unity for the categories "tax exempt institutions" and "insurance companies".

For the 1985 tax schedule, m is reduced from 0.640 to 0.572. In combination with the 1981 dividend credit system, the marginal tax rate on dividends m_d is then 0.473, and this implies that θ for households takes the value 1.23.

2.9 Tax-Exempt Institutions

Tax-exempt institutions by definition pay no tax on interest receipts, dividends, or capital gains. This category of owner includes different kinds of charities, scientific and cultural foundations, and foundations for employee recreation set up by companies. It includes also the equivalent of pension funds for supplementary occupational pension schemes.

One line of business of Swedish life insurance companies is to provide pension plans on an individual or collective basis. Such pension plans belong to tax category P ("Pension-insurance"), which exempts the insurance companies from tax on the yield of policy reserves. Contributions to individual pension plans are deductible against the personal income tax base up to a limit of 10 percent of earned income.

Contributions by employers to occupational pension schemes – determined by national collective bargaining – are likewise excluded from the taxable income of employers. Pension payments received are fully taxable to individuals. Savings for pension purposes under the rules described here thus receive the equivalent of consumption tax treatment.

The occupational pension scheme for white collar workers in the private sector (the PRI/FPG system) is rather differently organized. Under this system, pension payments are handled by the participating firms themselves, and these firms are required to account for their pension obligations by entering an item called "pension debt" on their balance sheets (see Table 4.19 below). The size of the pension debt of each individual firm is determined by the Pension Registration Institute (PRI) according to conventional actuarial principles.

66

As the size of the estimated and required pension reserve changes, the firm must make a corresponding allocation to its pension debt. This allocation – which does not affect cash flow, and which does not require any earmarking of the money retained – reduces reported profits and hence the base of the corporation income tax. Pension payments are likewise deductible against taxable profits.

These special features of the PRI/FPG system obviously do not affect the size of the required pension reserve or pension payments. Had the pension plan instead been administered by a separate insurance company – as is the case for blue collar workers – pension reserve allocations and pension payments would be covered by employer contributions and by the earnings on the pension reserve. These earnings would be tax-exempt under the regulations of tax category P, described above. Employer contributions would also be tax deductible for the participating firms.

The PRI/FPG system, allowing firms to exclude allocations to pension debt and pension payments from their taxable income, therefore effectively accords the same tax treatment to pension savings as that accorded to the "category P" pension schemes described above. The PRI/FPG savings have thus been included with the category of tax-exempt institutions.

2.10 Insurance Companies

This category of owner includes property insurance companies, the non-pension life insurance (category K) business of insurance companies, and labor market organizations. We consider these in turn.

Property insurance companies – for the most part mutual companies – pay a 29 percent local tax and a 40 percent national tax on the net income of the business, including interest receipts, dividends, and capital gains. Local tax payments, however, are deductible from the national tax assessment with a one year lag, making the total statutory tax rate approximately 57 percent.

It is important to note that the financial investments of insurance companies are treated as inventories by the tax authorities. The implication is that the accruing nominal changes in value of the investments (for example, changes in the market value of shares) constitute taxable income.

The effective tax rate on property insurance companies is, however, reduced below the statutory tax rate of 57 percent by some provisions affecting the tax base. Firstly, companies are allowed to undervalue their financial investments for tax purposes. Shares are valued at 60 percent of their market value and, as a result, taxable income is reduced by 0.4 when a company acquires a share of unit value. As the market value of the share changes, 60 percent of the accruing capital gain (or loss) is included in the tax base. Financial investments in debt instruments are valued at 90 percent of

67

market value. Secondly, a return of 4 percent on the investment is effectively exempt from tax. This exemption is accomplished by allowing the companies to annually allocate an amount equal to a return of 4 percent on the insurance fund to a tax free reserve.

The effective tax rate on the capital income of insurance companies can then be determined in the following way. Let the statutory tax rate be τ_s, and assume that a company acquires a financial investment of unit value which is written down to $1-\gamma$ for tax purposes. The net cost of investment is then $1-\gamma\tau_s$, since the undervaluation implies a deduction against the tax base of γ. Assume, furthermore, that the market value of the investment grows at a rate β with a dividend yield of μ. The taxable income on the investment at time u will then equal dividends received plus the accruing change in the tax accounting value of the investment, $(1-\gamma)\beta\ e^{\beta u}$, less the tax-exempt return, $\eta e^{\beta u}$ (where in practice η equals 4 percent). The after tax internal rate of return, j, on this investment is defined by the following equation (where the last term is the present value of after tax proceeds from selling the investment at time ω):

$$1-\gamma\tau_s = \int_0^\omega [\mu-\tau_s(\mu+(1-\gamma)\beta-\eta)]e^{\beta u-ju}du + (1-\gamma\tau_s)e^{\beta\omega-j\omega} .$$ (4.21)

This gives

$$j = (\mu+\beta) \left(\frac{1-\tau_s}{1-\gamma\tau}\right) + \frac{\tau_s\eta}{1-\gamma\tau_s}.$$ (4.22)

Now, the effective tax rate τ_e is defined as

$$\tau_e = \frac{(\mu+\beta) - j}{\mu+\beta},$$ (4.23)

which gives

$$\tau_e = \frac{\tau_s(1-\gamma)}{1-\gamma\tau_s} \left[1 - \frac{\eta}{(\mu+\beta)(1-\gamma)}\right] .$$ (4.24)

As explained, τ_s is 0.57, and γ equals 0.4 for shares and 0.1 for debt instruments. A return of $\eta=0.04$ is exempt from tax. The effective tax rate depends also on the actual yields to the insurance companies. For 1980, we have assumed a nominal rate of return $(\mu+\beta)$ of 11.8 percent on investments in shares and a 9.4 percent return on debt instruments. These rates of return correspond to the average effective yield for 1971-80 on the Stockholm Stock Exchange and on long-term industrial bonds, respectively. Equation (4.24) then gives an effective tax rate on dividends and accrued capital gains of 19 percent and an effective tax rate on interest receipts of 28 percent.

It should be noted that the tax-exempt yield η is fixed in nominal terms and, therefore, the effective tax rate will depend on the inflation rate. The

68

1980 effective tax rates of 0.19 and 0.28 thus reflect the actual rate of inflation used in our calculations for 1980, which is 9.4 percent. It is obviously difficult to know what rates of return insurance companies would have earned on their investments in 1980 in a hypothetical situation with no inflation. Equation (4.24) indicates that the effective tax rate would be zero if the returns on equity and debt instruments did not exceed 6.7 and 4.4 percent, respectively. It seems reasonable to assume that the rates of return with zero inflation would be below these critical values. We have assumed, therefore, an effective tax rate of zero in the case of no inflation.

The second type of tax treatment of insurance companies relates to non-pension life insurance business. Investment in this kind of policy belongs to the K-category ("Capital-insurance") for tax purposes. Premiums are paid out of after tax income, and the proceeds of such policies are not taxable. The insurance companies are liable for a 29 percent local tax and a 10 percent national tax on their net business income, including interest receipts, dividends, and capital gains. Because local tax payments are deductible against the base of the national tax, the combined result is a statutory tax rate of approximately 36 percent. This tax rate is then effectively reduced by some special provisions affecting the tax base. Firstly, 5 percent of net capital income is exempt from taxation, and secondly, companies are allowed to reduce their tax base by a factor of 0.003 times a "base" amount (basbelopp) for each policy. This amount was 16,000 SEK at the end of 1980. This last provision, however, is not taken into account here because its effects are assumed to be intra-marginal. The total statutory tax rate on the return on insurance policies of category K is therefore 34 percent (0.95 x 0.36).

As is the case for property insurance companies, the financial investments of the life insurance companies are treated as inventory holdings, and the same rates of undervaluation for tax purposes apply. The provision that exempts from tax a 4 percent return on the insurance fund, however, is not extended to life insurance companies. The effective tax rate on capital income is therefore

$$\tau_e = \frac{\tau_s(1-\gamma)}{1-\gamma\tau_s},$$ (4.25)

With $\tau_s = 0.34$, the effective tax rate is 24 percent on dividends and accrued capital gains, and 32 percent on interest receipts.

Finally, our category 'Insurance Companies' includes labor market organizations. These pay a 29 percent local tax and a 15 percent national tax on dividends and interest receipts, making a total tax rate of 40 percent (allowing for the deductibility of local tax payments). Capital gains are taxable according to the same schedule as for individuals (see Section 2.8). For 1980, therefore, the tax rate on realized capital gains equals 40 percent of the marginal income tax rate, that is, 16 percent.

69

The marginal tax rates on insurance companies are summarized in Table 4.5. The rates for the three groups, property insurance, non-pension life business, and labor market organizations, were weighted together using 1980 ownership proportions. These were 0.67, 0.17 and 0.16, respectively, for equity, and 0.68, 0.22 and 0.10 for debt.

The effective tax rates of Table 4.5 reflect the assumption that property insurance companies earn a nominal rate of return of 11.8 percent on their equity investments and 9.4 percent on debt instruments. The same yield assumptions are used for 1960 and 1970 in order to focus interest on the changes in tax legislation rather than on the combined effect over time of changes in tax legislation and actual market yields. The rules of undervaluation (expressed in the parameter γ) have applied since 1960, and the increases in the marginal effective tax rates from 1960 through 1980 are explained by the increases in the statutory tax rates caused by the gradual increases over time in local income tax rates.

Table 4.5 *Average Marginal Income Tax Rates (m) and Statutory Capital Gains Tax Rates (z_s) of Insurance Companies at 9.4 Percent Inflation (percent)*

	m		z_s
	Debt	Equity	
1960	23.8	17.4	12.9
1970	26.8	20.2	15.4
1980	30.1	23.4	19.1

Source: Own calculations as described in the text.

Table 4.6 *Average Marginal Income Tax Rates (m) and Statutory Capital Gains Tax Rates (z_s) of Insurance Companies at Zero Inflation*

	m		z_s
	Debt	Equity	
1960	6.8	7.1	2.3
1970	8.5	8.8	3.7
1980	11.0	10.6	5.0

Source: Own calculations as described in the text.

The (weighted average) effective marginal tax rates of insurance companies depend on the rate of inflation, to the extent that nominal yields to property insurance companies are affected by inflation. The numbers appearing in Table 4.5 reflect the "actual rate of inflation" of 9.4 percent, experienced over 1971-80. As explained above, it seems reasonable to assume that the market yields to property insurance companies at zero inflation would be sufficiently low to imply a zero marginal tax rate on investment income. Our estimates of the effective (weighted average) marginal tax rates of insurance companies at zero inflation, which are shown in Table 4.6, have been obtained using this assumption. The effective tax rates for 10 percent inflation have been estimated by simply extrapolating the rate of change in the effective tax rates between zero and 9.4 percent inflation.

Swedish insurance companies (as well as households and tax-exempt institutions) hold debt instruments in both interest bearing and non-interest bearing forms. According to our estimates, non-interest bearing debt accounted for 4.7 percent of the total debt holdings of insurance companies in 1980, and as explained in Section 2.8, we assume that income from non-interest bearing debt (accruing as bank services) is taxed at a zero rate. The marginal tax rate of insurance companies applicable to debt finance (to be used for the calculations presented in Section 4 below) is therefore obtained by multiplying the marginal tax rate derived in this section, and shown in Tables 4.5 and 4.6, by (1–0.047).

3. The Structure of the Capital Stock and its Ownership

In Section 2 of this chapter we presented the parameters needed to estimate the wedge between the pre-tax rate of return on a marginal investment project and the post-tax return on the savings made to finance the investment. We analyze this tax wedge for three kinds of real assets, three industry groups, three sources of finance and three categories of owners, implying 81 possible combinations of a hypothetical marginal investment. The purpose of this section is to describe the construction of the weights for these 81 combinations. These weights, in turn, are used for the estimates of the weighted average marginal tax rates presented in Section 4 below.

Table 4.7 *Distribution of Value Added in Sweden, 1980*

		Billions of Swedish Crowns		Percent	
1	*Manufacturing*		113.3		24.1
2	*Other Industry*		72.5		15.4
	a. Electricity, Gas, Water	14.3		3.1	
	b. Building and Construction	35.0		7.4	
	c. Transport and Storage	23.2		4.9	
3	*Commerce*		75.5		16.0
	a. Wholesale and Retail Trade	52.6		11.2	
	b. Other Services	22.9		4.8	
4	*Total Included Industries*		261.3		5 55.5
5	*Excluded Business Sectors*		92.4		19.6
	a. Agriculture, Forestry, Fishing	16.0		3.4	
	b. Mining and Quarring	2.4		0.5	
	c. Restaurants and Hotels	4.0		0.8	
	d. Communication (Public)	8.4		1.8	
	e. Finance, Insurance, Real Estate	61.6		13.1	
6	*Other Domestic Services, Discrepancies*		5.0		1.1
7	*Total Industry*		358.7		76.2
	a. Public Enterprises	22.6		4.8	
	b. State Business Agencies	22.3		4.7	
8	*Government Services*		112.1		23.8
9	*Gross Domestic Product*		470.8		100.0

Source: National Accounts of the Central Bureau of Statistics (SCB). Factor values exclude indirect taxes but include subsidies, in current prices. Lines 8 and 9 are estimates from annual reports of the included enterprises.

3.1 Data Limitations

Data limitations prevented us from computing separate numbers for more than 30 out of the 81 possible combinations. One obvious reason for the seemingly modest achievement is the difficulty in linking the real and financial activities of firms. We were forced to assume that within an industry, investment in the three types of assets was financed by debt, new shares issues and retained earnings in the same proportions.

Another difficulty was to identify the beneficial owners of financial securities in the different industries. We managed to produce rough estimates of the shares of financial liabilities in the respective industries held by each of the ownership groups, but we did not succeed in finding industry-specific equity ownership data.

We distinguish between three industry groups: manufacturing, other industry and commerce. Restricting the analysis to these three industrial sectors implies a restricted coverage of overall activity in the economy. The three groups accounted for about 56 percent of total GDP in 1980, as seen in row 4 of Table 4.7. The table shows also the importance of the public sector in Sweden. The "cost of production" in civil service departments, public authorities, etc., (Government Services, line 8) and the value added in publicly owned industry (lines 7a and 7b) together account for approximately one third of total value added. We have also excluded from our study nationalized industries and enterprises where the public interest is predominant, and unincorporated businesses. The implications of considering only the corporate sector are illustrated in Table 4.8 for the year 1979.

From National Accounts in column 1 of this table, State Business Agencies were excluded to obtain column 2. This adjustment affects Other Industry particularly, because of the state owned electricity company (Vattenfall) and the railroad company (Statens Järnvägar). Secondly, legal forms of organization other than corporations were excluded to obtain column 3. These units, for example, family businesses in the form of partnerships, are, as one could expect, most common in Wholesale and Retail Trade. Finally, we excluded state and local government corporations, for example, the large holding company Statsföretag. Summarizing the table, we see that the three industry groups defined in our study, account for no more than 38 percent of GDP (column 4, row 10). This limited coverage must be borne in mind when evaluating the results presented in Section 4.

The importance of confining the analysis to private corporations is further demonstrated in Table 4.9 which shows various characteristics of the total business sector divided according to legal form of organization. The table reveals the existence of quite substantial differences among the types of organization. For example, public corporations invested three times more than private corporations as seen in the fifth row, but these investments were internally financed to a much lesser extent than in private industry (row 4).

Table 4.8 *Value Added by Industries, 1979, in Billions of Swedish Crowns (BSEK)*

Industry	National Accounts Total		Financial Accounts Total		Financial Accounts. Non-Financial Corporations		Financial Accounts. Private Non-Financial Corporations	
	BSEK	%	BSEK	%	BSEK	%	BSEK	%
1 Manufacturing	102.9	100	100.8	98	97.3	95	89.7	87
2 Electricity, Gas, Water	11.8		3.8		3.7		1.7	
3 Building and Construction	31.8		19.0		18.5		18.1	
4 Transport	21.0		14.0		12.9		9.9	
5 Other Industry (2+3+4)	64.6	100	36.8	57	35.1	54	29.7	46
6 Wholesale and Retail Trade	47.5		43.8		35.2		32.8	
7 Other Services	20.7		9.3		8.5		7.2	
8 Commerce (6+7)	68.2	100	53.1	78	43.7	64	40.0	59
9 Total Included (1+5+8)	235.7	100	190.7	81	176.1	75	159.4	68
10 In Percent of GDP (416.0 BSEK)		56.7		45.8		42.3		38.3

Source: Enterprises, Financial Accounts, 1979, of the Central Bureau of Statistics (SCB), and unpublished data.

Nevertheless, the experience of private corporations (in column 3) was very similar to that for "all firms" (in column 1). The corporate form has, in fact, strengthened its dominant position during the past 50 years, as seen from Table 4.10. The table reveals, furthermore, a rather dramatic decrease in "individuals" (mainly single proprietorships), from almost one third of total operating income at the beginning of the 1930s to about 10 percent in 1979.

Suitable data on capital stocks, sources of financial capital, and ownership of debt and equity for our three industry groups are not readily available from official statistics. The numbers presented below are based on information from a number of sources, of which the most important was the annual publication Enterprises, Financial Accounts of the Swedish Central Bureau of Statistics (SCB). Unfortunately, information of acceptable quality on real capital stocks are not available from this source, and for this reason we have used also an additional classification scheme based on the National Accounts. Thus we have had to interface two partly separate industrial

74

Table 4.9 *Economic Characteristics of Different Parts of Industry*
All Industrial Sectors 1979

		All Firms	Corporations				Partner-ships	Associa-tions	Other Legal Forms
			All	Private	State	Local Gov.			
1	Value Added (BSEK)[a]	207.5	190.3	171.3	14.7	4.3	4.9	11.8	0.6
2	Gross Operating Profit/Value Added	21.5	21.0	21.5	10.3	38.2	39.4	22.8	12.6
3	Retained Earnings/ Gross Operating Income	4.2	4.3	4.3	3.2	11.0	8.9	2.1	5.3
4	Retained Earnings/ Gross Investment	117.7	113.8	134.6	36.9	80.4	266.4	121.7	112.5
5	Gross Investment/ Value Added	13.4	13.4	11.3	31.5	34.5	12.8	13.8	11.8
6	Value Added/Fixed Assets	155.7	154.8	183.9	65.1	59.5	252.3	150.5	90.9
7	Machinery/Net Capital Stock	23.7	24.1	23.9	20.6	46.1	32.8	15.6	10.1
8	Buildings/Net Capital Stock	25.2	24.7	21.5	38.4	39.8	13.9	32.9	80.2

Source: Enterprises, Financial Accounts 1979 and special computations from SCB. Note that the capital stocks are measured at book value and not replacement cost.
[a] Value added is in billions of Swedish crowns. All other rows are in percent.

classifications. Yet a third system of classifying business activity is used in Financial Statistics of the SCB, an important source for tracing the ownership of securities. Finally, we note that in some instances the latest year for which data were available was 1979.

3.2 Capital Stock Weights

Net capital stocks are estimated for two reasons. First, with values for real capital, financial assets, and debt, we are able to determine debt/equity ratios from the stock side, treating equity capital as a residual. These ratios are then used in the construction of weights for the different sources of finance (Section 3.3). Secondly, real capital stock figures are required in order to estimate the distribution of assets among the three industry groups. Our estimates of the proportions for machinery and buildings are based on unpublished tables of net capital stocks from the Swedish Central Bureau of Statistics (SCB). As described in Section 2.4, the SCB calculates these stocks using the perpetual-inventory method (see also Cederblad 1971). The SCB estimates refer to activity as a whole and are scaled down to the corporate sector using data on value added for national accounts enterprises, on the one hand, and for private corporations on the other.

Inventory values for non-financial private corporations are obtained from the Financial Accounts of Enterprises. These inventories are valued according to certain legal rules and are normally not very different from replacement cost values. The written-down book values (for tax purposes) are, of course, much lower, as seen in Section 2.3.

Table 4.11 shows the distribution of the corporate capital stock among assets and industries in 1980. The corresponding matrix of the nine assets by industry capital stocks and proportions is shown in Table 4.12. Two remarks should be made in connection with Table 4.12. The first has to do with the concept of inventories in the "Building and Construction" part of Other Industry. As can be seen from the table, inventories constitute a remarkably high share, more than 50 percent, of the capital in that particular sector. This

Table 4.10 *The Distribution of Gross Operating Income by Legal Form of Organization, for All Industrial Sectors (percent)*

	1930	1950	1972	1979
Corporations	53.1	60.7	74.1	75.3
Partnerships	5.1	2.6	2.0	2.1
Economic Associations	6.4	11.3	11.7	10.4
Individuals	30.1	19.9	6.3	
				12.2[a]
State Business Agencies and Other Legal Forms	5.3	5.5	5.9	
Total	100.0	100.0	100.0	100.0

Source: The 1931, 1951 and 1972 Census of Enterprises and Enterprises, Financial Accounts 1979. The 1979 figures are not fully comparable with those for earlier years.
[a] No data is available for Individuals and State Business Agencies in 1979, and we use therefore the same share of gross operating income as for 1972.

Table 4.11 *Proportions of Non-Financial Capital Stock by Asset and Industry, 1980. Private Corporations Only*

Asset	Industry		
	Manufacturing	Other Industry	Commerce
Machinery	0.2635	0.0253	0.0345
Buildings	0.2127	0.0662	0.0620
Inventories	0.1496	0.0957	0.0905

Source: National Accounts and Enterprises, Financial Accounts and own calculations.

76

Table 4.12 *Private Corporate Capital Stock, 1980*

	Manufacturing		Other Industry		Commerce		Total	
	BESK[a]	%	BSEK[a]	%	BSEK[a]	%	BSEK[a]	%
Machinery	121.168	42.1	11.628	13.5	15.891	18.5	148.687	32.3
%	81.5		7.8		10.7		100.0	
Buildings	97.807	34.0	30.422	35.4	28.495	33.1	156.724	34.1
%	62.4		19.4		18.2		100.0	
Inventories	68.772	23.9	44.018	51.1	41.618	48.4	154.408	33.6
%	44.5		28.5		27.0		100.0	
Total	287.747	100.0	86.068	100.0	86.004	100.0	459.819	
%	62.6		18.7		18.7		100.0	

Source: National Accounts and Enterprises, Financial Accounts and own calculations.
[a] Billions of Swedish Crowns.

is, however, merely a reflection of the fact that inventories include buildings either under construction or recently completed but not yet sold.

The second remark concerns the rapidly growing use of *leasing* as a way of expanding capacity. The SCB assigns such investments to the sector of ownership (mainly financial companies). It should be noted, however, that assets acquired by leasing in Sweden, in contrast to many other countries (e.g., the United Kingdom), still seem to account for an insignificant part of the total capital stock – less than one percent. There may, however, be some potentially important tax advantages to leasing. For example, a firm with positive taxable profits could purchase assets and claim the 20 percent investment allowance (see Section 2.5) and then lease the assets to firms with zero taxable profits. This could enable firms with zero taxable profits to take advantage of the investment allowance. Since 1982 this particular arrangement can no longer be used. According to the new rules, the investment allowance can be claimed only by the "final users" of assets.

The alternative approach to measuring capital stock weights would be to compute proportions using data on investment flows. To demonstrate the differences between the stock and flow methods, we have put together, in Table 4.13, the resulting asset proportions for Manufacturing, had they instead been based on gross investments. As can be seen, the pattern is much changed, with machinery receiving a large weight. In a steady state situation with no net investment, we would expect this outcome, since machines in general depreciate faster than buildings and therefore have to be replaced sooner. The reader is referred to the discussion of this point in Chapter 2.

Table 4.13 *Proportions of Capital and of Gross Investment in Manufacturing*

	Net Capital Stock 1980	Investments 1970–80	Investments 1980
Machinery	42.1	65.5	62.8
Buildings	34.0	23.7	19.7
Inventories	23.9	10.8[a]	17.5[a]
Total	100.0	100.0	100.0

Source: National Accounts and Enterprises, Financial Accounts and own calculations.
[a] Changes in stocks of inventories.

3.3 Sources of Financial Capital

To estimate market value debt-equity ratios, the following approach was used. The first stage was to estimate the replacement cost value attributable to equity. Using the net capital stock calculations – at current replacement cost – and balance sheet data on financial assets and liabilities together with our own calculations of the contingent tax liability resulting from accelerated depreciation and inventory write-down, the replacement cost value of equity was determined as a residual. Net trade credit was excluded. In the second stage, we estimated the market value of equity using a sample of thirteen major engineering corporations (or conglomerates), accounting for 40 percent of sales in manufacturing and 25 percent of the market value of the Stockholm Stock Exchange in 1980. The ratio of market value to replacement cost (the "q" ratio) for the 13 large corporations is shown in Table 4.14. Our calculations indicate that equity in 1960 had a market value very close to its estimated replacement value. The "q-ratio" fell to 0.6 in 1970 and further to 0.3 in 1980, reflecting the poor performance of the Swedish stockmarket. These q-ratios were assumed to be representative of the three industry groups. The market values of equity were then computed as q times the estimates of the replacement cost value of equity, using the 1970-80 average value of q equal to 0.51.

In judging this method for calculating the market value of equity, it should be noted that, in view of the preferential tax treatment of capital gains, it may be quite rational for a firm to undertake investments that produce less than a dollar's worth of capital gains for the marginal dollar of retention, leading to a value for q of less than unity (Bergström and Södersten, 1976). In

78

Table 4.14 *"q-Ratios" for 13 Major Engineering Corporations*[a] *(percent)*

Year	q
1970	59.3
1971	73.6
1972	74.3
1973	62.8
1974	50.8
1975	57.2
1976	48.0
1977	37.3
1978	34.3
1979	29.4
1980	31.3

Source: Own calculations. The underlying capital stocks were constructed assuming a geometric rate of depreciation of 5.4 percent, corresponding to the average rate for machinery and buildings in manufacturing. See section 2.4 above. The last three years are measured directly, and the preceding years are estimates. The corporations are: Alfa Laval, ASEA, Atlas Copco, Bahco, Bulten-Kanthal, Electrolux, ESAB, Fläktfabriken, Ericsson (LME), PLM, Saab-Scania, SKF, and Volvo.
[a] The q-ratio is the ratio of market value to net worth.

equilibrium, shareholders would be indifferent between a dollar of dividends and $(1-m)/(1-z)$ dollars worth of capital gains, if dividends were taxed at the rate m and (accrued) capital gains at the rate z. For $m = 0.409$ and $z = 0.096$, representing weighted average marginal tax rates for equity investors in 1980, this "marginal rate of substitution of dividends for capital gains" takes the value of 0.65. This analytically derived value for "marginal q" is well in line with the q-ratios appearing in Table 4.14 for the first half of the 1970's.

The debt-equity ratio was estimated as the ratio of the market value of debt to the market value of equity. For the former, we used data on the book value of debt because very little debt is marketable. The market for corporate bonds is rather thin in Sweden, and the share of bonds in total net debt held by beneficial owners is less than five percent.

The division of equity finance between retained earnings and new issues was estimated from sources of funds data, and we used a three year average (1978–80). Since new share issues to acquire an existing company ("apport-emission") do not constitute a source of net new finance, such issues were excluded from our calculations. The three year average was necessary to prevent cyclical fluctuations in both retained earnings and new issue activity from biasing the results. Table 4.15, summarizes the result of this exercise. We were able to separate Manufacturing in this table but not able to

Table 4.15 *Equity Finance 1971–80*

Year	Manufacturing			Other Industry Commerce		
	New Issues[a]	Retained Earnings[a]	New Issues as a % of Equity Finance[b]	New Issues[a]	Retained Earnings[a]	New Issues as a % of Equity Finance[b]
1980	1.362	17.478	7.23	1.539	18.790	7.57
1979	1.252	15.654	7.41	1.077	16.719	6.05
1978	0.313	11.057	2.75	1.054	11.360	8.49
1977	0.344	5.437	5.95	1.291	10.587	10.87
1976	1.060	11.950	8.15	2.766	11.435	19.48
1975	1.214	13.447	8.28	1.034	9.997	9.37
1974	0.949	17.099	5.26	0.549	10.521	4.96
1973	0.268	11.541	2.27	0.345	8.067	4.10
1972	0.488	7.098	6.43	0.371	6.220	5.63
1971	0.329	6.146	5.08	0.361	5.292	6.39
1971/80	7.579	116.907	6.09	10.387	108.988	8.70
1978/80	2.927	44.189	6.21	3.670	46.869	7.26
1978/80 adjusted	1.850	44.189	4.02	2.319	46.869	4.71

Source: New issues (cash payments) are from the Central Bank and the Registration Office for Enterprises (PRV). Retained Earnings are from Financial Accounts for Enterprises. Manufacturing also includes Mining. Other Industry/Commerce is "Other Companies" (excluding Bank and Credit Institutions, Manufacturing, Mining, Agriculture and Forestry). In the row "1978/80 adjusted", new issues have been corrected for intermediate purchases (see Table 4.18 below).

[a] In billions of Swedish Crowns.
[b] 100 x (New Issues)/(New Issues + Retained Earnings).

80

distinguish Commerce from Other industry. Making use of the data on identical enterprises with more than 50 employees in 1979 and 1980, we managed to extrapolate the 1979 data for private corporations to 1980.

Finally, the shares of different sources of corporate finance were obtained by adjusting both debt and equity for intermediate ownership. The adjustment coefficients are given in Sections 3.4 and 3.5 below, and the final weights for the different sources of finance appear in Table 4.16. The first thing to notice from the table is that the proportion of total finance from new share issues is, as in other countries, very small. Another striking feature is the high degree of indebtedness in Other Industry and Commerce. The higher debt ratio in the former industry is explained by the fact that buildings in progress, which are included in inventories in Table 4.12, are typically financed by short-term debt, and that inventories make up a particularly large share of the net capital stock. This is illustrated by the approximate figures on the maturity structure of debt given in Table 4.17. Long-term debt accounted for 66.8 percent of total borrowing in manufacturing, but only 51.6 percent in Commerce and 33.4 percent in Other Industry.

Table 4.16 *Sources of Finance in Each Industry 1980*

Source of Finance	Industry		
	Manufacturing	Other Industry	Commerce
Debt	40.5	81.2	62.5
New Share Issues	2.4	0.9	1.8
Retained Earnings	57.1	17.9	35.7
Total	100.0	100.0	100.0

Source: Own calculations as described in the text.

Table 4.17 *Maturity Structure of Private Corporate Debt in Each Industry, 1980*

Industry	Long-Term Debt as Percent of Net Financial Debt
1 Manufacturing	66.8
2 Other Industry	33.4
a. Electricity, Gas, Water	96.5
b. Building, Construction	13.3
c. Transportation	72.9
3. Commerce	51.6
a. Wholesale, Retail Trade	50.9
b. Private Services	57.8

Source: Own calculations based on unpublished data from the National Accounts and Enterprises, Financial Accounts.

3.4 Ownership of Equity

We would like to obtain ownership weights for equity which reflect beneficial ownership, that is, intermediate holdings should be excluded. There is, unfortunately, no readily available information about such indirect or *nominee* ownership. In Table 4.18, the numbers showing the distribution of owners in 1979/80 have therefore been obtained from many different sources; the main source was a report to the 'Commission on Wage-Earners Funds' (Boman 1982). Substantial complementary calculations of our own were, however, necessary.

The major drawback of these ownership distributions is that they refer only to shares quoted on the Stock Exchange. Unquoted shares are not

Table 4.18 *Share Ownership in Sweden 1979/80 and 1975/76 in Billions of Current Swedish Crowns*
(proportions in parentheses)

		1979/80	1975/76
1	*Households*	23.2	22.0
		(0.604)	(0.724)
	Direct Ownership	21.9	21.5
	In Share Funds	1.0	0.5
	In Tax-Sheltered Funds	0.3	–
2	*Tax-exempt Institutions*	11.6	6.0
		(0.302)	(0.197)
	Life Insurance (type P)	4.3	2.2
	Charities & Foundations	7.3	3.8
3.	*Insurance Companies*	3.6	2.4
		(0.094)	(0.079)
	Property Insurance	2.4	2.0
	Life insurance (type K)	0.6	0.3
	Labor Market and Other Taxable Organizations	0.6	0.1
	Total	38.4	30.4
		(1.000)	(1.000)
4	*Other Ultimate Owners*		
	Government	2.3	0.4
	Other Organizations	0.5	0.2
	Foreign Owners	3.0	2.0
	Total Ultimate Owners (1+2+3+4)	44.2	33.0
5	*Intermediate Owners*	16.6	12.0
	Investment Companies	8.5	7.0
	Other Companies	8.1	5.0
6	*Total Stock of Shares*	60.8	45.0

Source: Boman (1982), Carlsson (1978), Spånt (1975), Aktiv Placering, and own calculations.

included, since there are few data with which to determine their ownership, and valuation is difficult in the absence of an active market. If we assume that the relationship between book and market values for unquoted companies was the same as for quoted companies, then these unlisted corporations would, as a group, have a market value exceeding the value of all listed corporations by approximately 50 percent. We also know that intermediate ownership is much larger for unlisted companies. Roughly one half of the shares in these companies are owned by other firms, and between 15 and 20 percent belong to the public sector, leaving one third to direct beneficial owners (compared with two thirds of the quoted shares, as seen below). The lion's share of these holdings is held by households, non-profit bodies and the like, rather than by pension funds and insurance companies.

If the ownership of these unquoted shares were included in our study, it is quite plausible that the share of households would be larger than the 60 percent figure in Table 4.18. Our calculations, however, are solely based on the ownership of shares listed on the Stockholm Stock Exchange, the only stock market in Sweden. Considering the relative smallness of this market, we have not attempted to construct industry specific ownership proportions. Although the quoted sector accounts for roughly 40 percent of all private corporate sales and an even larger share of gross profits, it is heavily dominated by Manufacturing with few firms from industries such as construction, transportation and commerce.

In Table 4.18 we see that the principal owner of equity is the household sector, accounting for 60 percent of total beneficial ownership. There has, however, been a significant downward trend in the fraction of equity owned by households.

The decreasing household ownership has, of course, a counterpart in the growing importance of institutions as shareholders. Classifying all but households as institutions, we notice a 10 percentage point increase during the last half of the seventies for this group. The growth is especially marked for governmental institutions (e.g. the AP-fund explained below), insurance companies, and tax-exempt institutions. Foreign ownership has, on the other hand, stayed rather constant during the period. In 1981, however, there was a marked increase in foreign investors' interest in the Swedish stockmarket. This interest was partly due to an abolition in 1979 of some formal obstacles to "export" of Swedish shares, and for the first time a surplus was registered for this type of portfolio investment in the capital account.

Foreign ownership of Swedish industry is more important than indicated by the stockmarket figures of Table 4.18, however. The reason for this is that the greater part of foreign ownership is accounted for by direct investment rather than by portfolio investment. Foreign investors' total share of (beneficial) equity ownership in Sweden amounts to nearly 10 percent.

Investment companies, shown in the table as intermediate owners, have held a fairly constant share of the ownership of listed corporations. These

Swedish investment trusts are of the so called "closed end" type, that is, the share capital is not freely variable. A major feature of the investment trusts from a tax point of view is that dividends are exempted from tax, provided at least 80 percent of the receipts are redistributed.

Table 4.18 shows that the beneficial owners included in our study account for 63.2 percent of the total value of the Swedish stockmarket (38.4 out of 60.8 BSEK). This share is the adjustment coefficient referred to in Section 3.3. It is used to adjust available data on new share issues and retained earnings prior to estimating the shares of different sources of corporate finance.

Table 4.19 *Liabilities of Swedish Enterprises, 1980, in Billions of Current Swedish Crowns*
(proportions in parentheses)

		Manufacturing	Other Industry	Commerce
1	*Households*	7.9	18.1	9.2
		(0.252)	(0.750)	(0.482)
	Trough Banks	7.0	17.3	5.8
	Direct Lending	0.9	0.8	3.4
2	*Tax-Exempt Insitutions*	21.1	4.8	9.1
		(0.672)	(0.199)	(0.476)
	Pension debt (PRI)	16.1	2.1	4.5
	Life Insurance (type P)	3.9	1.9	1.0
	Charities & Fountations	1.1	0.8	3.6
3	*Insurance Companies*	2.4	1.2	0.8
		(0.076)	(0.051)	(0.042)
	Property Insurance	1.8	0.9	0.4
	Life Insurance (type K)	0.5	0.2	0.1
	Labor Market Organizations	0.1	0.1	0.3
	Total Beneficial Owners	31.4	24.1	19.1
		(1.000)	(1.000)	(1.000)
4	*Other Domestic*	57.7	52.2	26.0
	"Special" Lending	5.5	2.0	2.2
	ATP	12.2	4.0	1.7
	Government	5.8	25.0	1.9
	Short-term Financial Debt	34.2	21.0	20.2
5	*Foreign Owners*	22.8	7.5	2.8
	Loans	16.1	6.8	2.8
	Bonds	6.7	0.7	–
6	*Total Financial Debt*	111.9	83.6	47.9

Source: Enterprises, Financial Accounts and own calculations.

84

3.5 Ownership of Debt

Table 4.19 shows the ownership of financial debt in our three sectors. The estimates are based mainly on unpublished primary tables from the Financial Accounts of Enterprises (covering *all* enterprises with more than 50 employees, on an industry by industry basis). The industry specific parameters for beneficial ownership of corporate debt are shown in the top half of the table. Beneficial ownership accounts for 28, 29 and 40 percent of total debt in Manufacturing, Other industry and Commerce, respectively. These proportions are the adjustment coefficients for debt used in Section 3.3 to estimate the shares of different sources of finance.

In keeping with our general approach, we exclude public ownership, and hence the ownership weights calculated from the tables exclude direct government lending and "Special Lending". "Special Lending" denotes the lending activities carried out by a number of financial institutions funded via the state budget. These institutions provide debt finance on terms which often are more favorable than those prevailing in the regular capital market.

The National Supplementary Pension Plan (ATP) is by far the most important scheme of occupational pensions in Sweden. The ATP-plan, enacted in 1960 and financed by employers' contributions, is basically a 'pay as you go' system where total contributions each year are supposed to cover that year's pension payments. However, during the introductory years of the system, the rates of employer contributions were set by Parliament at such a high level that a fund of considerable size was created. There is no connection in the ATP-plan between the size of this fund (or its earnings) and the pension benefits. The idea behind creating a fund during the period of introduction was rather "(i) to make possible a gradual introduction of the plan without creating inequity between different age groups, (ii) to compensate for an expected decline in private insurance savings, (iii) to make possible a general increase in capital formation without raising taxes and (iv) to enhance the ability of the economy to fulfil pension commitments in a future with a greater number of retired persons to be supported by the plan" (Bentzel and Berg 1983, p. 169). Thus, the ATP-plan may be schematically described as a "pay as you go" system combined with a payroll tax that earmarks part of the revenue for financial investment. These characteristics motivate the exclusion of the ATP-fund investments from our ownership weights.

Furthermore, we exclude "short-term financial debt" and foreign owners from our ownership weights. Under the heading "short-term financial debt", we include inter-firm debt and VAT liabilities and income taxes deducted at source but not yet paid to the government. Finally, bank holdings of corporate debt – advances and bonds – have been imputed to households, insurance companies and other owners according to the respective ownership categories' shares of total bank deposits, regarding banks as financial intermediaries.

4. Estimates of Effective Marginal Tax Rates

This section presents the effective marginal tax rates on capital income in the corporate sector in Sweden. It is organized in the following way. Section 4.1 summarizes the results of the "base case", which represents our best estimates of the parameter values for the tax system and for the capital stock weights in 1980. As explained in earlier sections of this chapter, however, some important changes in tax legislation, including a new dividend tax credit system and a reduction in personal income tax rates, have been made in recent years. In Section 4.2, the effects of these changes are analyzed. For purposes of comparison, calculations of effective tax rates are presented also for 1960 and 1970 in Section 4.3. Finally, in Section 4.4, we present a comparison between calculations of effective marginal tax rates and average tax rates on the return to capital invested in the non-financial sector.

Table 4.20 *Effective Marginal Tax Rates, Sweden, 1980, Fixed-p Case* (percent)

	Inflation Rate		
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	−18.1	1.5	0.2
2. Buildings	28.9	37.3	36.6
3. Inventories	26.5	71.0	68.8
Industry			
1. Manufacturing	8.1	28.3	27.1
2. Other industry	29.6	62.6	60.5
3. Commerce	12.1	40.7	39.2
Source of Finance			
1. Debt	−12.9	6.4	5.0
2. New Share Issues	44.2	93.2	90.4
3. Retained Earnings	40.9	69.5	68.2
Owner			
1. Households	57.1	108.0	105.1
2. Tax-exempt Inst.	−39.2	−52.8	−51.8
3. Insurance Co.	−16.0	22.0	18.9
Overall	12.9	37.0	35.6

4.1 Principal Results

Table 4.20 shows the marginal effective tax rates on private non-financial corporate investment in Sweden in 1980 for the fixed-p case in which all assets earn a pre-tax real annual rate of return of 10 percent. Each column of the table corresponds to a specific assumption about the inflation rate. Three assumptions are explored, namely a zero rate of inflation, the actual average rate of inflation of 9.4 percent experienced in 1971-80, and a 10 percent rate of inflation.

The first three rows of the table show the marginal tax rates for machinery, buildings and inventories. These are average marginal tax rates where the average has been taken over all industry groups, sources of finance, and categories of owner.

The variation in effective tax rate by asset is striking. As far as investment in machinery is concerned, the present tax system approximates an expenditure tax (equivalent to a zero tax rate on capital income). It is, in fact, more favorable than an expenditure tax at a zero inflation rate, providing a net subsidy to investment in machinery. For other assets, the tax rate is higher. With a fully indexed comprehensive income tax, the marginal tax rates corresponding to Table 4.20 would equal an average of marginal income tax rates. In 1980, the average marginal income tax rate of households (taken over debt and equity) was 57.3 percent, and apart from investment in inventories when inflation is high, the present tax system is more favorable than an income tax.

The differences in effective tax rates among the industry groups are explained mainly by differences in the composition of their capital stock. Inventories constitute twice as large a share of the total net capital stock in Other Industry and Commerce as in Manufacturing, and inventory investment is the most heavily taxed type of real investment. The average allowed rate of inventory writedown is only 19.3 percent for Other Industry compared to 60 percent for the other two industry groups, as seen in Section 2.3, and this contributes to the dispersion of tax rates.

The effective marginal tax rate differs markedly among the different sources of finance. The relatively lower tax rates on debt finance are explained by the combined effect of allowing companies to deduct the nominal cost of debt and the fact that the average marginal income tax rate on interest income is lower than that on dividends and capital gains. New share issues constitute the most heavily taxed form of equity finance, despite the special scheme to mitigate the "double taxation" of dividends (see Section 2.2).

There are dramatic differences in effective tax rates among the three categories of owner. Investment financed by savings channeled through tax-exempt institutions receives a substantial subsidy. The effective tax rate of minus 51.8 percent means that for a 10 percent rate of return on real investments undertaken by corporations, tax-exempt institutions earn a

87

post-tax real rate of return of 15.2 percent on their savings. This seemingly paradoxical result is explained by the interaction between personal and corporate taxation and the fact that the corporate tax system provides a subsidy to real investment.

The taxation of the return to savings channeled directly to companies by households represents the case opposite to that of tax-exempt institutions. At the inflation rate actually experienced in the period 1971-80, the wedge between the pre-tax and post-tax rates of return corresponds to more than 100 percent of the pre-tax rate of return. ·

The last row of Table 4.20 shows the overall average marginal tax rates, where the average is taken over source of finance, category of owner, industry, and type of asset. At the actual rate of inflation in 1971–80, this overall tax rate of 35.6 percent is considerably below the average marginal tax rate of households of 57.3 percent.

On *average,* therefore, the present tax system is more favorable than a comprehensive income tax, and at low rates of inflation, it is closer to an expenditure tax than to an income tax. An important difference between the present system and either an expenditure tax or a comprehensive income tax, is, of course, the wide dispersion of effective tax rates around the mean and their sensitivity to inflation. Both of these issues are investigated further in Chapter 7.

A comparison of the different columns of Table 4.20 reveals the effects of inflation on effective tax rates. The Swedish tax system is not indexed, and it is often assumed that this causes the effective tax burden to rise as the rate of inflation increases. This belief is, for Sweden, confirmed by our study. An increase in the inflation rate from zero to 10 percent almost triples the overall effective tax rate. There are several factors that combine to explain this remarkable result. The real value of historical cost depreciation is undermined by inflation and FIFO accounting rules make corporations pay tax on purely nominal capital gains on inventory holdings. Inflation reduces also the real value of the special Swedish scheme to mitigate the "double taxation" of dividends (the Annell-deduction). Inflation increases the nominal market interest rate and the resulting increase in nominal interest receipts is included with the income tax base of households and insurance companies. Insurance companies are further affected by inflation because inflation reduces the real value of nominally fixed deductions for reserves (see Section 2.10). These tax increasing effects of inflation are partly offset by the fact that nominal interest costs are fully deductible against the taxable income of corporations. This last provision actually outweighs the taxation of nominal interest receipts to investors, since the (effective) corporate tax rate, τ, exceeds the personal rate, m, averaged over investors. The difference between the two rates is reduced by inflation, however, and the reason for this is that the effective corporate tax rate is reduced by inflation (see Section 2.5).

88

Tax-exempt institutions provide a striking exception to the rule that inflation raises tax rates. In the "fixed-p" case, we calculate the maximum nominal rate of return the company can afford to pay on the financial claims of investors. Under the Swedish corporate tax system, a *ceteris paribus* increase in inflation leads to an increase in the real market yield which can be paid to investors. For tax-exempt institutions this raises the real rate of return on savings. For households and insurance companies, however, the increase in real market yields is not enough to compensate for the income taxation of the nominal returns to debt and equity.

It is interesting to note that inflation increases the dispersion of effective tax rates dramatically. The tax differential between machinery and inventories increases from 45 percentage points at zero inflation to 73 percentage points at 10 percent inflation. Similarly, the tax differential between households and tax-exempt institutions increases from 96 percentage points at zero inflation to 161 percentage points at a 10 percent rate of inflation.

The results for the 'fixed-r' case are shown in Table 4.21. By assuming that the yield to investors before personal tax is the same for all investment projects, the tax rates obtained are in general higher than those in the "fixed-p" case. The reasons for this difference were explained in Chapter 2. It is important to note, however, that the variation in effective tax rates according to asset, industry, source of finance and category of owner is equally true of the "fixed-r" case as it is of the "fixed-p" case.

Table 4.21 *Effective Marginal Tax Rates, Sweden, 1980, Fixed-r Case* (percent)

	Inflation Rate		
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	−113.9	2.8	−0.7
2. Buildings	33.6	49.2	48.5
3. Inventories	37.8	73.4	72.5
Industry			
1. Manufacturing	12.5	46.2	45.1
2. Other industry	32.6	78.7	77.0
3. Commerce	12.7	54.9	53.7
Source of Finance			
1. Debt	−25.5	13.4	11.5
2. New Share Issues	40.8	94.1	92.9
3. Retained Earnings	50.3	91.2	89.6
Owner			
1. Households	74.0	143.6	141.0
2. Tax-exempt Inst.	−58.2	−69.6	−68.8
3. Insurance Co.	−28.5	30.9	26.9
Overall	16.7	54.9	53.6

4.2 Recent Changes in Tax Legislation

Several changes in the taxation of investment income have been introduced or proposed during the last few years. These include the so-called tax savings scheme, the dividend tax credit introduced in 1981, and the proposed "1985 system" of personal income taxation. The details of these changes were presented in Sections 2.1 and 2.8 above.

We consider first the "new rules of 1981", which are defined to include the tax savings scheme and the dividend tax credit. They imply that (a) the average marginal tax rate on the interest income of households is reduced from 49.2 to 44.0 percent; (b) θ, the opportunity cost of retained earnings in terms of dividends foregone, for households is raised from unity to 1.403, but remains at unity for institutional investors; (c) there is a minor reduction in the statutory capital gains tax on households from 26 to 22 percent (arising from the tax savings scheme). Table 4.22 shows the effects of these new rules for the 'fixed-p' case. Their main effect is to bring about a considerable reduction in the marginal effective tax rate on savings channeled through new share issues. Depending on the rate of inflation, the effective tax rate on new share issues is reduced by between 10 and 17 percentage points, making new share issues less heavily taxed than retained earnings at zero inflation. New issues remain, however, the most heavily taxed source of equity capital at higher rates of inflation because the effect of the scheme to mitigate the double taxation of dividends, the Annell-deduction, is undermined by inflation (see Section 2.2).

The 1981 "new rules" apply only to households, but the reduction in the average effective marginal tax rate on households is quite small. Depending on the rate of inflation the reduction ranges from 3.5 to 6 percentage points. The explanation for this limited effect on household taxation is, of course, the relative unimportance of new share issues as a means of channeling household savings into real investment.

A major reform of personal income taxation was decided upon by the Swedish Parliament in June 1982 and is due to come into full effect in 1985. It implies a reduction in the average marginal income tax rate of household equity investors from 64.0 percent in 1980 to 57.2 percent. The statutory marginal tax rate on capital gains, which equals 40 percent of the marginal income tax rate, is therefore, reduced from 26 to 23 percent. The average marginal income tax rate of household investors' debt is cut from 49.2 percent in 1980 to 43.3 percent, taking into account that a 98.6 percent fraction (see Section 2.8) of household income on debt instruments is in taxable form. The combination of the cut in the marginal income tax rate of equity investors and the dividend tax credit system implies that the tax discrimination variable θ takes the value of 1.23 for household investors. (The tax savings scheme is not considered as part of the "1985 system".)

As shown in Table 4.23, the 1985 rules reduce the overall average effective

Table 4.22 *Effective Marginal Tax Rates, Sweden, 1981 Rules, Fixed-p Case* (percent)

| | Inflation Rate | | |
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	−19.9	−1.1	−2.3
2. Buildings	27.3	34.1	33.5
3. Inventories	24.5	67.8	65.7
Industry			
1. Manufacturing	7.1	26.9	25.7
2. Other industry	25.7	55.2	53.4
3. Commerce	9.8	36.9	35.4
Source of Finance			
1. Debt	−16.7	0.8	−0.5
2. New Share Issues	34.6	75.8	73.5
3. Retained Earnings	41.0	70.2	68.8
Owner			
1. Households	53.6	102.0	99.2
2. Tax-exempt Inst.	−39.2	−52.8	−51.8
3. Insurance Co.	−16.0	22.0	18.9
Overall	11.1	34.1	34.7

Table 4.23 *Effective Marginal Tax Rates, Sweden, 1985 Rules, Fixed-p Case* (percent)

| | Inflation Rate | | |
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	−21.7	−4.4	−5.6
2. Buildings	26.2	31.5	30.9
3. Inventories	23.4	65.7	63.7
Industry			
1. Manufacturing	5.7	23.9	22.9
2. Other industry	24.6	53.1	51.3
3. Commerce	8.7	34.6	33.2
Source of Finance			
1. Debt	−16.7	−0.3	−1.5
2. New Share Issues	33.0	73.0	70.7
3. Retained Earnings	39.1	65.7	64.5
Owner			
1. Households	49.6	93.9	91.4
2. Tax-exempt Inst.	−39.2	−52.8	−51.8
3. Insurance Co.	−16.0	22.0	18.9
Overall	9.8	31.4	30.1

tax rate at 10 percent inflation by no more than 3 percentage points as compared to the 1981 rules. Only household investors are affected, however. Depending on the rate of inflation, their tax reduction ranges from 4 to 8 percentage points.

The third and final alternative considered in this section represents a change in tax legislation of a different kind. We shall examine the effects of abolishing the corporation income tax (and associated grants and allowances). This represents an interesting case not only because the abolition of the separate tax on corporate profits has been suggested in Sweden as an alternative to tax reform, but also because it brings out clearly the importance of the corporation tax for the results presented above. Furthermore, in practice many Swedish corporations do not pay any corporation income tax as a result of the combination of low pre-tax earnings and the existing extensive possibilities to reduce taxable profits. Another important group of companies with low pre-tax earnings pay corporation tax just sufficient to meet the requirement in Swedish law that dividends be paid out of current or accumulated book profits (which in turn are approximately equal to tax accounting profits). For these companies, an additional investment project may not affect total tax payments, provided tax allowances on already existing assets have not been fully used. (For further discussion of this point, see Section 4.4.) The effective marginal tax rates in the fixed-p case for $\tau=0$ and $g=0$, appear in Table 4.24.

A comparison between Tables 4.24 and 4.20 makes it clear that elimination of the corporation income tax would bring about a considerable increase in the overall effective tax rate. The explanation for this increase is that the range of tax concessions to investment is sufficiently great that taken together they more than offset the effects of the tax. The required rate of return on a project is a decreasing function of the corporate tax rate. Readers looking for a full discussion of this point are referred to the second part of Appendix C. In the case of debt finance, the effective tax rate falls as the corporate tax rate rises if the tax allows full interest deductibility and depreciation allowances in excess of the value of true economic depreciation. When interest payments are not deductible, the tax rate falls only when allowances and grants for investment are worth more than 100 percent of first year allowances (immediate expensing). The same argument applies to equity finance with the condition about deductibility of interest payments replaced by a condition about the deductibility of dividends (imputation credit). With immediate expensing, and no imputation credit for dividends, the corporate tax reduces the net cost of investment by the same proportion as it reduces the present value of the earnings from the investment. Hence when the tax system allows deductions which have a value greater than that implied by immediate expensing, companies pay a negative tax on equity-financed marginal investments.

As shown in Tables 4.24 and 4.20 the abolition of the corporation tax

Table 4.24 *Effective Marginal Tax Rates, Sweden, with the Corporation Tax Abolished Fixed-p Case*
(percent)

	Inflation Rate		
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	25.4	45.7	44.0
2. Buildings	27.6	50.3	48.8
3. Inventories	29.4	54.1	52.6
Industry			
1. Manufacturing	23.7	42.1	40.9
2. Other industry	39.6	75.3	73.1
3. Commerce	28.1	51.7	50.2
Source of Finance			
1. Debt	25.3	50.4	48.8
2. New Share Issues	49.9	92.3	89.7
3. Retained Earnings	29.1	47.9	46.7
Owner			
1. Households	62.8	112.3	109.3
2. Tax-exempt Inst.	−11.9	−26.0	−25.2
3. Insurance Co.	−7.0	23.6	20.7
Overall	27.5	50.1	48.7

would result in a sharp rise in the effective tax rate on debt-financed investments. With the exception of the rate on new issue finance at zero inflation, the abolition of the corporate income tax would reduce the effective tax rate on the return to equity financed investment. This fact indicates that the combined effect of the available deductions and grants on average is less favorable than free depreciation. Inspection of the results for the 81 individual combinations in Appendix B makes it clear, however, that the depreciation allowances for machinery in combination with the 11.4 percent investment grant are more favorable to firms than free depreciation. The corporation tax, therefore, provides a subsidy to marginal investments in machinery irrespective of the source of finance, although it is a positive tax as far as other assets are concerned.

4.3 Comparisons with 1960 and 1970

Promotion of industrial growth by means of generous investment incentives at the corporate level has been a paramount policy objective of Swedish governments for more than two decades. During this period, there has been a rapid growth of total taxes, from 27 percent of GDP in 1960 to 41 percent in 1970, and to 50 percent in 1979 (see Table 4.1 above). It is particularly interesting to examine the changes over time in the incentives to save and

invest, as measured by the effective marginal tax rates on capital income, in the light of this growing tax burden.

Brief accounts of the derivation of the parameter values for 1960 and 1970 were given in Section 2. In 1960 Sweden had a classical system of corporate taxation, whereas in 1970 some mitigation of double taxation had been introduced through the Annell-legislation. By 1980, the Annell-deduction had increased further. The rules of inventory valuation and of fiscal depreciation of machinery have not been changed since the mid-1950s, whereas for buildings an extra 2 percent allowance was introduced in 1970. In 1960 investment in machines and buildings was taxed under the sales tax at a rate equivalent to an investment grant of *minus* 2 percent. No investment grants were available in 1970, whereas in 1980 investment in machinery and buildings qualified for allowances equivalent to investment grants of 11.4 percent and 5.7 percent, respectively. The rules of the investment funds system (IF) were altered during the late 1970s, and the system was also put to more active use. At the margin, as explained in Section 2.5, the IF-system effectively reduces the corporate tax rate below the statutory tax rate. As a result, the effective corporate tax rate (as defined in Section 2.5 and assuming a 9.4 percent inflation rate) was 37 percent in 1960, 41 percent in 1970 and 35 percent in 1980, as compared to the statutory corporate tax rates for the three years of 49, 53, and 57 percent. The statutory corporate tax rate increased over time as a result of gradual increases in local income tax rates.

The 1960s and 1970s brought considerable increases in household tax rates. The average marginal tax rates on household investors in debt and equity rose from 34 and 45 percent in 1960, respectively, to 48 and 58 percent in 1970, and to 50 and 64 percent in 1980. Taxation of capital gains on household shareholdings was introduced in the mid-1960s and by 1970 and 1980 the average marginal statutory tax rates had risen to 15 and 26 percent, respectively.

As a result of increases in local income tax rates, the marginal tax rate on insurance companies (estimated at a 9.4 percent inflation rate) rose from 24 percent in 1960 to 27 percent in 1970 and to 30 percent in 1980 for investment in debt, whereas the marginal tax rate on dividends increased from 17 percent in 1960 to 20 percent in 1970 and 23 percent in 1980. Capital gains taxes were increased from 13 percent in 1960 to 15 percent in 1970 and 19 percent in 1980.

The results of our calculations of effective marginal tax rates on capital income in 1960 and 1970 are shown in Tables 4.25 and 4.26. The combined effect of the rising marginal tax rates on investors and of the more generous investment incentives has been to leave the overall effective marginal tax rate, at a 9.4 percent inflation rate, practically the same in 1980 as in 1960. The zero inflation effective tax rate was almost halved between 1960 and 1980. A comparison between Tables 4.25, 4.26 and 4.20 reveals, furthermore, that the effective tax rates rose between 1960 and 1970 and fell again

94

Table 4.25 *Effective Marginal Tax Rates, Sweden, 1960, Fixed-p Case*
(percent)

| | Inflation Rate | | |
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	16.2	16.8	16.7
2. Buildings	31.3	28.1	28.3
3. Inventories	19.9	58.2	56.1
Industry			
1. Manufacturing	21.5	30.8	30.3
2. Other industry	29.5	45.8	44.9
3. Commerce	19.1	35.9	35.0
Source of Finacne			
1. Debt	2.1	1.3	1.3
2. New Share Issues	58.4	99.9	97.6
3. Retained Earnings	44.4	69.6	68.3
Owner			
1. Households	50.2	82.3	80.4
2. Tax-exempt Inst.	−10.0	−26.7	−25.6
3. Insurance Co.	4.6	29.5	27.3
Overall	22.6	34.6	33.9

Table 4.26 *Effective Marginal Tax Rates, Sweden, 1970, Fixed-p Case*
(percent)

| | Inflation Rate | | |
	Zero	Ten	Actual (9.4)
Asset			
1. Machinery	15.2	20.3	19.9
2. Buildings	33.1	34.5	34.4
3. Inventories	24.1	72.5	69.9
Industry			
1. Manufacturing	21.7	35.6	34.8
2. Other industry	36.1	63.2	61.6
3. Commerce	21.1	45.9	44.5
Source of Finance			
1. Debt	2.0	8.4	7.9
2. New Share Issues	55.6	103.7	100.9
3. Retained Earnings	48.4	79.1	77.5
Owner			
1. Households	60.6	106.4	103.7
2. Tax-exempt Inst.	−18.3	−37.6	−36.3
3. Insurance Co.	−0.3	27.6	25.1
Overall	24.3	42.7	41.6

between 1970 and 1980. This development is explained by the fact that most of the increases of personal taxes occurred between 1960 and 1970, whereas the reduction in corporation tax was concentrated in the period 1970-80.

There are some noteworthy differences in the changes in effective tax rates over time between the three categories of owners. For tax-exempt institutions, the effective cuts in the corporation tax have brought about a considerable reduction in the effective tax rate over time, whereas for households the greater investment incentives have been insufficient to counteract rising marginal tax rates. We note also that the tax discrimination against new share issues was more pronounced in 1960 than in 1980, and the explanation for this is that in 1960 there was no mitigation of double taxation. The variation in effective tax rate by asset was less striking in 1960 and 1970 than in 1980. The main reason for this difference is that the investment grants available in 1980, but not available in 1960 and 1970, favored investment in machinery over that in buildings.

A final observation concerns the sensitivity to inflation of the effective tax rates. Inflation causes the overall effective tax rate to rise for both 1960 and 1970, but the tax-increasing effects of inflation are less dramatic than in 1980. While historical cost depreciation and FIFO accounting rules provide explanations common to all three years for the increase in effective tax rates with inflation, the differences in the sensitivity to inflation are mainly explained by the fact that the purely nominal increases in market yields to investors were taxed at lower rates in 1960 and 1970 than in 1980. It should be noted finally, that for 1960, the effective tax rate on the return to debt financed investment falls as the rate of inflation increases, while the opposite is true for both 1970 and 1980. In 1960 the tax-reducing effect of deducting interest costs at the (effective) corporate tax rate of 37 percent outweighs the tax-increasing effect of taxing nominal interest receipts to all three categories of owners.

4.4 Comparison with Average Tax Rates

It is of interest to compare the calculations of marginal effective tax rates presented above with estimates of the average tax rates implied by actual tax payments. The calculations presented in this section all refer to the national accounts sector of non-financial enterprises. In addition to our three industry groups (Manufacturing, Other Industry and Commerce) the national accounts data cover also mining and quarrying, agriculture, forestry and fishing, real estate and business services. Public business agencies (for example, the State Railway Company) as well as other non-private and unincorporated enterprises are included. The choice of the non-financial enterprises sector for our calculations has been dictated by the lack of suitable alternative data.

The 1970s represented a period of dramatic change for the Swedish

96

Table 4.27 *Corporate Profits and their Appropriation, Sweden, 1978–80*
(Billions of Swedish Crowns, in current prices)

	1978–80 Average
Real Operating Profits (of which)	14.224
Corporate Taxes (including subsidies)	−2.078
Interest Payments[a]	19.932
Dividend Payments	3.833
Real Retained Earnings	−7.463

Source: Own calculations based on National Accounts 1980.

[a] Non-financial firms pay dividends and interest on debt both to other firms within the same sector and to recipients outside the sector. Firms likewise receive dividends and interest earnings from both within and outside the sector. By interest payments we mean the sum of all interest costs less the sum of all interest receipts. Dividend payments are defined analogously.

Table 4.28 *Average Tax Rate on Real Corporate Profits*
(Billions of Swedish Crowns, in current prices)

	1978–80 Average	Percent of Profits
Total Taxes (of which)		
Including Subsidies	4.184	29.42
Excluding Subsidies	10.432	73.34
Corporate Taxes (of which)	−2.078	−14.61
Corporate Tax Payments	4.170	29.32
Ad Hoc Subsidies	−6.248	−43.93
Taxes on:		
Interest Payments	5.043	35.45
Dividend Payments	1.568	11.02
Real Retained Earnings	−0.719	−5.05
Personal Wealth	0.370	2.60
Real operating profits	14.224	
Average Tax Rate (in percent)		
Including Subsidies	29.4	
Excluding Subsidies	73.3	
Average Profit Rate (in percent)		
Gross of Tax	2.0	

Source: Own calculation as described in the text.

economy. After the 1971-72 recession and the oil crisis of 1973, Swedish firms, and in particular manufacturing firms, experienced a boom in profits of an intensity not witnessed since the Korean War. The subsequent downturn, beginning in 1976, was equally dramatic, with the severest profits crisis for manufacturing industry since the 1930s. Business conditions improved again in 1979 and 1980, even though profits remained at a low level compared with their previous long-term average. This is clearly reflected in Table 4.27, which shows corporate profits and their appropriation among corporate taxes, interest payments, dividend payments and retained earnings. As a result of low profits, retained earnings net of economic depreciation were negative in 1978-80. A significant feature of the government's response to the difficulties facing business was large subsidies to industry (Carlsson, Bergholm and Lindberg, 1981). This policy, which included both rescue operations on a massive scale and investment subsidies on an *ad hoc* basis, is reflected in the second row of Table 4.27. Corporate taxes of minus 2,078 million SEK are here defined as the sum of corporate tax payments of 4,170 million and *ad hoc* subsidies of no less than 6,248 million SEK. It should also be noted that despite the downturn in profits, payments of corporation tax and payments of dividends from the non-financial sector continued to increase in 1978-80, as compared to earlier years.

The average effective tax rate for the non-financial sector is defined here as the ratio of total taxes on capital income originating in the sector to real operating profits (net of economic depreciation). Its calculation is summarized in Table 4.28. Data on actual tax payments are available only for the corporation tax. The actual amounts of income tax paid by the owners of debt and equity on interest receipts and dividends cannot be observed. Investment income is included with earned income for assessment of tax, and it is not possible to determine whether investment income comes "first" or "last". We have estimated tax payments on interest receipts and dividends by simply multiplying the interest and dividend payments of the sector by the weighted average marginal tax rates on interest income and dividends, respectively, using the ownership proportions presented in Sections 3.4 and 3.5 as weights. The 1980 average marginal tax rates were 25.3 percent on interest income and 40.9 percent on dividend income.

Retained earnings are taxed as capital gains to the extent that profit retention causes the market value of equity to rise. We assume here that the tax rate on retained earnings can be approximated by the effective rate of tax paid by the owners of equity on accrued capital gains.

As explained in Section 2, the effective capital gains tax rate of insurance companies is 19 percent, and for simplicity we have taken the effective accruals tax (EAT) rate of households to be one-half of the statutory tax rate of 26 percent. This gives a weighted average tax rate on the retained earnings of the non-financial sector of 9.6 percent.

The Swedish wealth tax is assessed on the net wealth (assets less liabilities)

98

of households, and there is no obvious way in which to allocate wealth tax payments among various assets. It is possible, however, to obtain rough estimates of the amounts of wealth taxes paid on account of the holdings of equity and debt of non-financial enterprises. In his recent study of household wealth, Spånt (1979) gives a detailed account of the distributions of financial and real assets of various kinds, as well as household debt, over different size classes of net (taxable) wealth. This information makes it possible to estimate the wealth tax payments of each class, using the tax schedule presented in Section 2.7. We then simply assume that the wealth tax payments can be allocated proportionately among the various assets of each class. If, for example, shares make up 30 percent of total assets of a specific class of net wealth, 30 percent of the wealth tax payments of this class are allocated to the shares. This approach is obviously equivalent to assuming that within a specific class of net wealth, assets of all kinds are financed by debt in the same proportion.

Using this approach, we estimate that approximately 25 percent of total wealth tax payments may be attributed to equity holdings and 13 percent to the ownership of bank deposits. Since only some 35 percent of bank lending goes to the non-financial sector, we attribute only 5 percent of total wealth tax payments to household ownership of debt. Hence in total, 30 percent of wealth tax payments are attributed to the non-financial corporate sector, and the resulting 370 million SEK figure is shown in Table 4.28.

Our estimates of the average effective tax burden on capital income from the non-financial sector appear in Table 4.28. When the *ad hoc* subsidies extended to the business sector during the crisis are treated as negative taxes, the average tax rate turns out to be 29.4 percent. This is 6 percentage points lower than the overall average marginal tax rate for 1980, at the actual average rate of inflation. If on the other hand, the 6.2 billion SEK of subsidies are excluded, the average tax rate rises to 73.3 percent. Considering the very low level of business profits in 1978-80, it is of interest to compare these numbers with corresponding figures for earlier years. For 1973 – the year preceding the profits boom of 1974-75 – we estimate the average effective tax rate to be 35.4 percent including subsidies and 42.2 percent when subsidies extended on an *ad hoc* basis are excluded.

For the comparison with the results of Section 4.1, however, there are several observations to be made. As already pointed out, the tax rate in Table 4.28 reflects actual tax payments and profits associated with both old and new assets held by firms, whereas the effective tax rates of Section 4.1 refer to a set of hypothetical "marginal" investments. With a corporate tax system that allows firms extensive possibilities to defer tax payments through various schemes of accelerated depreciation, actual tax payments and the share of profits paid as corporate income tax become endogenous. They depend on the rate of growth of real investment and on the firms' (average) rate of return (see Södersten, 1975 and 1978).

The theoretical calculations of effective tax rates in this study are all based on the crucial assumption that corporations take full advantage of depreciation allowances and rules of inventory undervaluation. This implies either that the "representative" firm has profits which are sufficiently large, or that the tax laws provide for full loss offset on "tax accounting" losses. Empirical studies on a large number of Swedish firms indicate, however, that most firms have not been able to fully use the existing extensive possibilities to reduce or defer corporate tax payments. There is, in fact, a strong correlation between the use of accelerated depreciation, etc., and the (before tax) rate of return of individual firms. As a result, high profit firms have a lower effective annual tax burden than low profit firms.

A possible explanation for this result is the combined effect of the requirement of Swedish law that dividends must be paid out of current or accumulated book profits and of the close connection between book and tax accounting profits. Within the limits set by tax legislation, Swedish firms may themselves decide upon the size of the profits reported on the books, through a more or less intensive use of accelerated depreciation, variations in the valuation of inventories, and allocations to investment funds. If a policy of stable dividends is to be maintained, a firm with low profitability may not be able to make full use of these possibilities of tax deferral. This means that the effective (annual) tax burden will be high in comparison with a more profitable firm which is able to use all its tax allowances.

Appendix C: Technical Aspects of the Swedish Tax System

1. Annell Deduction

The first point we discuss is the value of the Annell deduction for new share issues. In section 2.2 of Chapter 4 we argued that the deduction must be transformed into a tax saving per dollar of investment. The problem of transformation arises simply because assets depreciate. In deriving the cost of capital for a hypothetical investment project, we implicitly assumed that the financial capital raised to pay for the investment was repaid to the investors as the asset depreciated. In the light of this, it is not reasonable to interpret the Annell-rules to imply that a firm which raises 100 crowns worth of new equity capital to finance an asset that depreciates in, say, 5 years time, would be able to deduct h(100) annually for w years notwithstanding the fact that after 5 years the original 100 crowns are already repaid to the equity investors. Consider an all equity firm which distributes all of its after tax economic profits, including real capital gains. This firm would issue new shares at time u of an amount, N(u), equal the change in the nominal value of its capital stock,

$$N(u) = P_K \dot{K} + \dot{P}_K K \tag{C.1}$$

where P_K denotes the price of capital goods and K the net capital stock.

Assuming geometric depreciation at the rate δ so that $I = \dot{K} + \delta K$, we have

$$N(u) = P_K I - (\delta - \pi) P_K K \tag{C.2}$$

where $\pi = \dot{P}_K / P_K$. The flow of new equity capital therefore equals the amount required to finance gross investment minus the amount repaid to the owners to maintain the chosen equity-capital ratio (of unity) as the capital stock depreciates and the price level rises.

In the case of pure *debt* finance the equation corresponding to (C.2) represents the net change in debt. The two terms appearing on the right hand side of (C.2) then have a clear interpretation as borrowing to finance new investment and amortization of previously acquired debt to maintain the debt-capital ratio. Such a distinction is obviously difficult to make in the case of new issues, since it is hard to imagine that firms in practice would simultaneously raise and pay back new equity capital. For analytical purposes, however, we may look upon the flow of new share capital to the firm as the *net* of the amount raised to finance investment and the amount repaid to the owners. It is clear from (C.2) that except for the case $\delta = \pi$, the amount of new share capital raised by the firm N(u), and on which the firm claims Annell-deductions, is not equal to gross investment. Let H be the

present value of tax savings per dollar of new issue, defined by equation (4.1) in Section 2.2. The equivalent present value of tax savings per dollar of *investment*, A_A, can then be defined as

$$\int_0^\infty A_A P_K I \cdot e^{-\varrho u} du = \int_0^\infty HN(u) \cdot e^{-\varrho u} du \qquad (C.3)$$

Integrating by parts, and assuming $K(0) = 0$, it can then be shown that

$$A_A = \left(\frac{\varrho}{\varrho-\pi+\delta}\right) H \qquad (C.4)$$

where $\varrho/(\varrho-\pi+\delta)$ is interpreted as the amount of new issues which 'on average' is required per dollar of gross investment. Hence, the 'net cost of investment', as defined in Chapter 2, becomes

$$1 - A = 1 - f_1 A_D - f_2 \tau - f_3 g - A_A \qquad (C.5)$$

Equation (C.4) assumes that fiscal depreciation coincides with economic depreciation. As explained in Section 2.3 of Chapter 4, Swedish tax laws allow firms accelerated depreciation. The deferral of corporation tax brought about by accelerated depreciation is often compared to an interest free loan from the Treasury. The deferred corporate tax may thus be regarded as a source of finance to the firm.

Let A_E represent the present value of the tax savings from true economic depreciation, taken to be replacement cost depreciation minus the nominal capital gain which accrues on fixed assets (cf. Bergström-Södersten 1981 and King 1977, p. 243),

$$A_E = \frac{\tau(\delta-\pi)}{\varrho-\pi+\delta}$$

The value of actual tax allowances may be written as

$$A = A_E + f_3 g + (f_1 A_D + f_2 \tau - A_E) \qquad (C.6)$$

where the last (bracketed) term may be interpreted as the presented value of the tax savings from accelerated depreciation. The equation for MRR in Chapter 2 then becomes

$$MRR = \delta - \pi + \frac{\varrho}{1-\tau}[1 - \left(\frac{\varrho-\pi+\delta}{\varrho}\right)(f_1 A_D + f_2 \tau - A_E)]$$
$$- \frac{f_3 g(\varrho-\pi+\delta)}{1-\tau} \qquad (C.7)$$

To interpret (C.7) consider the case when there is no accelerated depreciation. In this case $f_2 = 0$, $f_1 = 1$ and $A_D = A_E$. Gross capital cost MRR then equals the rate of change in the nominal value of the asset $(\delta-\pi)$ plus the required before tax net rate of return. This net rate of return is the firm's

pre-tax rate of discount $(\varrho/(1-\tau))$ less the imputed gross return on the investment grant.

As can be seen from (C.7) the effect of accelerated depreciation is to reduce the weight attached to the firm's before tax rate of discount, and this effect has a clear economic interpretation. Consider a hypothetical situation where the Treasury, rather than provide accelerated depreciation allowances, offers to finance a fraction E of the acquisition cost of the investment by an interest-free loan, to be repaid at the rate of true economic depreciation $\delta - \pi$. In order for the firm to be indifferent between this arrangement and accelerated depreciation, E must be chosen such that the present value of the imputed interest on this loan equals the reduction in the present value of tax payments obtained by accelerating depreciation allowances. This condition means that:

$$\int_0^\infty \varrho E e^{-(\delta-\pi+\varrho)u} du = f_1 A_D + f_2 \tau - A_E \qquad \text{(C.8)}$$

Solving (C.8) we obtain

$$E = (\frac{\varrho - \pi + \delta)}{\varrho}) (f_1 A_D + f_2 \tau - A_E) \qquad \text{(C.9)}$$

This is exactly the term which appears in our expression for capital cost. E may be regarded as the proportion (in present value terms) of the investment which on average is financed by deferred taxes, and, therefore, 1–E as the proportion financed by new equity (or debt or retained earnings).

We may now express the effects of the Annell-deduction as

$$A_A = (\frac{\varrho}{\varrho - \pi + \delta}) H (1-E)$$

$$= \frac{\tau h[1 - e^{-\varrho\omega}]}{\varrho - \pi + \delta}[1 - (\frac{\varrho - \pi + \delta}{\varrho}) (f_1 A_D + f_2 \tau - A_E)] \qquad \text{(C.10)}$$

There is, finally, an empirical problem to take into account when analyzing the effects of the Annell-deduction. In practice, few Swedish firms pay dividends on new share capital of as much as 10 percent, which is the maximum rate of Annell-deduction. Available data suggest an average dividend yield of 6 percent for firms issuing new shares at the end of the 1970s, implying an Annell-deduction of 6 percent following the new issue. It is reasonable to assume, however, that a successively higher rate of deduction – relative to the amount raised by the new issue – can be claimed for later years, since the amount of dividends paid by firms typically increase over time. Our numerical calculations actually assume that, starting at 6 percent, the rate of Annell-deduction increases over time at the rate of inflation. A 10 percent rate of inflation means, therefore, that the maximum Annell-deduction (10 percent) can be claimed on the sixth year after the new issue (assuming the initial deduction to be 6 percent). The firm then deducts

10 percent annually for an additional 6 years, after which time the sum of deductions taken equals the amount raised by the new issue. For the case of stable prices the annual deduction of 6 percent is taken for 16.7 years.

2. The Effects of Abolishing Corporate Income Tax

We examine here the relationship between the corporate tax rate and the tax wedge between savings and investment. Equation (2.17) of Chapter 2 may be written as

$$p = \frac{\varrho}{1-\tau}[1-X] - \pi \qquad (C.11)$$

where

$$X = (\frac{\varrho-\pi+\delta}{\varrho}) (f_2\tau + f_1 A_D + f_3 g + A_A - A_E) \qquad (C.12)$$

When the sum of the investment grant ($f_3 g$) and the present value of the tax savings from depreciation allowances, etc., exceed the tax savings from true economic depreciation (A_E), $X > 0$. If the tax system allows immediate expensing of investment and no further deductions or grants ($f_2 = 1, f_1 = f_3 = A_A = 0$) equation (C.12) simplifies to $X = \tau$. We note also that the abolition of the corporate income tax implies $X = 0$.

For debt finance, the firm's after tax rate of discount ϱ is related to the nominal market interest rate i by the equation (2.24) of Chapter 2 which is

$$\varrho = i(1-\tau) \qquad (C.13)$$

Substituting into (C.11) yields

$$i = \frac{p+\pi}{1-X_D} \qquad (C.14)$$

where the subscript D signifies that the discount rate ϱ takes the value $i(1-\tau)$. Equation (C.14) defines (in implicit form, since i appears as an argument of X_D) the maximum nominal interest i the firm can afford to pay on a loan acquired to finance an investment project with a pre-tax rate of return p (say 10 percent).

It is clear from equation (C.14) that if the tax laws provide for accelerated write off ($X_D > 0$), the abolition of the corporation income tax (making $X_D = 0$) would reduce i. Through the fall in the nominal interest rate i the post-tax return to savings is reduced, increasing the wedge between the pre- and post-tax rates of return p and s and therefore the effective tax rate.

In the case of an equity financed investment project, equation (C.13) is replaced by $\varrho = i/\theta$ for new share issues and $\varrho = i(1-m)/(1-z)$ for retained earnings. Since the corporate tax rate τ does not appear in these equations,

104

the effect of abolishing the corporation tax can be inferred directly from equation (C.11). Inverting this equation yields

$$\varrho = (p+\pi) \left(\frac{1-\tau}{1-X}\right)$$

(C.15)

It is immediately clear that only if $X > \tau$ at the outset, will p, and therefore i, fall as the corporation tax is abolished. Thus only if tax laws allow firms deductions (or grants) that reduce tax payments by more than would immediate expensing, will the wedge between the pre- and post-tax rates of return p and s (and therefore the effective tax rate) increase upon abolishing the corporation income tax.

References

Bentzel, Ragnar and Berg, Lennart. 1983. The role of demographic factors as a determinant of savings. In Modigliani, F. and Hemming, R. (ed.), *National Savings and Wealth,* International Economic Association. London: MacMillan.

Bergström, Villy and Södersten, Jan. 1976. Double taxation and corporate capital cost. Working Paper No. 9, 1976. Stockholm: Industriens Utredningsinstitut.

Bergström, Villy and Södersten, Jan. 1981. Inflation, Taxation and Capital Cost. In Eliasson, G. and Södersten, J. (eds.), *Business Taxation, Finance and Firm Behavior.* IUI Conference Reports 1981:1. Stockholm: Industriens Utredningsinstitut.

Boman, Ragnar. 1982. Ägarstrukturen i börsföretagen. In Löntagarna och kapitaltillväxten 9. Statens offentliga utredningar (SOU) 1982:28.

Carlsson, Bo, Bergholm, Fredrik and Lindberg, Thomas. 1981. *Industristödspolitiken och dess inverkan på samhällsekonomin.* Stockholm: Industriens Utredningsinstitut.

Carlsson, Torsten. 1976. *Aktiemarknadens roll.* Aktiespararnas skriftserie nr. 7. Stockholm: Sveriges Aktiesparares Riksförbund.

Cederblad, Carl Olof. 1971. *Realkapital och avskrivning.* Urval nr. 4. Stockholm: Statistiska Centralbyrån.

Hulten, Charles R. and Wykoff, Frank C. 1981. The measurement of economic depreciation. In Hulten, C.R., (ed.), *Depreciation, inflation, and the taxation of income from capital.* Washinton, D.C. The Urban Insitute.

Jakobsson, Ulf and Normann, Göran. 1974. *Inkomstbeskattningen i den ekonomiska politiken.* Stockholm: Industriens Utredningsinstitut.

King, Mervyn A. 1977. *Public Policy and the Corporation.* London: Chapman and Hall.

Normann, Göran. 1978. Bruttobeskattning och skatter på produktionsfaktorer. In Normann, Göran and Södersten, Jan, *Skattepolitisk resursstyrning och inkomstutjämning.* Stockholm: Industriens Utredningsinstitut.

Normann, Göran. 1982. Sweden. In Aaron, H. (ed.), *VAT Experiences of Some European Countries.* Deventer: Klower Law and Taxation Publishers.

Rundfelt, Rolf. 1981. Capital Gains Taxation and Effective Rates of Return. In Eliasson, G. and Södersten, J. (eds.), *Business Taxation, Finance and Firm Behavior.* IUI Conference Reports 1981:1. Stockholm: Industriens Utredningsinstitut.

Rundfelt, Rolf. 1982. Några av bolagsbeskattningens principer. Stockholm: Sveriges Industriförbund. Mimeographed.

Spånt, Roland. 1979. Den svenska förmögenhetsfördelningens utveckling. In *Löntagarna och kapitaltillväxten 2.* Statens offentliga utredningar (SOU) 1979:19.

Statens Offentliga Utredningar. 1969. *Kapitalbeskattningen.* SOU 1969:54.

Statens Offentliga Utredningar. 1977. *Beskattningen av företag. Bilagor.* SOU 1977:87

Statistiska Meddelanden. 1981. *Inkomstfördelningsundersökningen 1978:1.* SM N 1981:1. Stockholm: Statistiska Centralbyrån.

Statistiska Meddelanden. 1981. *Nationalräkenskaper.* SM N 1981:2.5. Stockholm: Statistiska Centralbyrån.

Södersten, Jan. 1975. Företagsbeskattning och resursfördelning. Ph.D. diss. University of Uppsala.

Södersten, Jan. 1982. Accelerated Depreciation and the Cost of Capital. *Scandinavian Journal of Economics* 84(1): 111–115.

Waldenström, Erland, (ed.), 1976. *Företagsvinster, kapitalförsörjning, löntagarfonder.* Stockholm. Sveriges Industriförbund, Svenska Arbetsgivarföreningen.

Wallander, Jan. 1962. *Verkstadsindustrins maskinkapital.* Stockholm: Industriens Utredningsinstitut.

Wallmark, Kerstin. 1978. Planenkäten 1978. In *Industrikonjunkturen våren 1978.* Stockholm: Sveriges Industriförbund.

Winfrey, Fobley, 1935. *Statistical Analysis of Industrial Property Retirements.* Bulletin 125, Iowa Engineering Experiment Station. Ames, Iowa: Iowa State College of Agriculture and Mechanical Arts.