Table 6.1: Simulations Result Of OLG Model Without Social Security

Time,t	Output	Interest_Rate	Wage	Young_Consumption	Saving	Capital_Next_Period	Old_Consumption
1970	0.3040261669	4.8268337256	0.2128183168	0.1064091584	0.1064091584	0.1036116440	0.0000000000
1971	0.5065502913	1.4666796267	0.3545852039	0.1772926020	0.1772926020	0.1726315501	0.2624773032
1972	0.5903860009	1.0259758437	0.4132702006	0.2066351003	0.2066351003	0.2012026293	0.3591905288
1973	0.6181446226	0.9216747683	0.4327012358	0.2163506179	0.2163506179	0.2106627243	0.3970854585
1974	0.6267239752	0.8925033755	0.4387067827	0.2193533913	0.2193533913	0.2135865544	0.4094442747
1975	0.6293209258	0.8839333464	0.4405246481	0.2202623240	0.2202623240	0.2144715911	0.4132471686
1976	0.6301021073	0.8813784206	0.4410714751	0.2205357376	0.2205357376	0.2147378165	0.4143967833
1977	0.6303366508	0.8806133839	0.4412356556	0.2206178278	0.2206178278	0.2148177486	0.4147424597
1978	0.6304070309	0.8803840024	0.4412849216	0.2206424608	0.2206424608	0.2148417340	0.4148462340
1979	0.6304281465	0.8803151996	0.4412997025	0.2206498513	0.2206498513	0.2148489301	0.4148773727
1980	0.6304344813	0.8802945598	0.4413041369	0.2206520684	0.2206520684	0.2148510890	0.4148867149
1981	0.6304363817	0.8802883679	0.4413054672	0.2206527336	0.2206527336	0.2148517367	0.4148895177
1982	0.6304369519	0.8802865104	0.4413058663	0.2206529332	0.2206529332	0.2148519310	0.4148903585
1983	0.6304371229	0.8802859531	0.4413059860	0.2206529930	0.2206529930	0.2148519893	0.4148906107
1984	0.6304371742	0.8802857859	0.4413060219	0.2206530110	0.2206530110	0.2148520068	0.4148906864
1985	0.6304371896	0.8802857358	0.4413060327	0.2206530164	0.2206530164	0.2148520120	0.4148907091
1986	0.6304371942	0.8802857207	0.4413060360	0.2206530180	0.2206530180	0.2148520136	0.4148907159
1987	0.6304371956	0.8802857162	0.4413060369	0.2206530185	0.2206530185	0.2148520141	0.4148907179
1988	0.6304371960	0.8802857149	0.4413060372	0.2206530186	0.2206530186	0.2148520142	0.4148907186
1989	0.6304371962	0.8802857145	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907187
1990	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1991	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1992	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1993	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1994	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1995	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1996	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1997	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1998	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
1999	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188

[illegible] Model Without Social Security

Time,t	Output	Interest_Rate	Wage	Young_Consumption	Saving	Capital_Next_Period	Old_Consumption
2000	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2001	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2002	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2003	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2004	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2005	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2006	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2007	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2008	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2009	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2010	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2011	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2012	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2013	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2014	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2015	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2016	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2017	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2018	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2019	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188
2020	0.6304371962	0.8802857143	0.4413060373	0.2206530187	0.2206530187	0.2148520143	0.4148907188

APPENDIX II

1970	0.2128183168	0.1064091584	0.1064091584	0.1036116440	0.0240420853	0.0000000000	0.0234100149
1971	0.3545852039	0.1737073135	0.1574678756	0.1533280191	0.3025347937	-0.0035852885	0.0390043724
1972	0.4132702006	0.1986550492	0.1756107791	0.1709939426	0.3657132467	-0.0079800512	0.0454597221
1973	0.4327012358	0.2063394175	0.1809020962	0.1761461501	0.3863490618	-0.0100112004	0.0475971359
1974	0.4387067827	0.2086487776	0.1824608691	0.1776639427	0.3919185329	-0.0107046137	0.0482577461
1975	0.4405246481	0.2093414739	0.1829254281	0.1781162883	0.3935101852	-0.0109208502	0.0484577113
1976	0.4410714751	0.2095492589	0.1830645050	0.1782517088	0.3939797976	-0.0109864787	0.0485178623
1977	0.4412356556	0.2096115919	0.1831062014	0.1782923091	0.3941199501	-0.0110062359	0.0485359221
1978	0.4412849216	0.2096302915	0.1831187080	0.1783044868	0.3941619295	-0.0110121693	0.0485413414
1979	0.4412997025	0.2096359014	0.1831224597	0.1783081400	0.3941745173	-0.0110139498	0.0485429673
1980	0.4413041369	0.2096375844	0.1831235852	0.1783092359	0.3941782931	-0.0110144841	0.0485434551
1981	0.4413054672	0.2096380893	0.1831239229	0.1783095646	0.3941794258	-0.0110146443	0.0485436014
1982	0.4413058663	0.2096382407	0.1831240242	0.1783096633	0.3941797656	-0.0110146924	0.0485436453
1983	0.4413059860	0.2096382862	0.1831240546	0.1783096929	0.3941798676	-0.0110147068	0.0485436585
1984	0.4413060219	0.2096382998	0.1831240637	0.1783097017	0.3941798982	-0.0110147112	0.0485436624
1985	0.4413060327	0.2096383039	0.1831240664	0.1783097044	0.3941799073	-0.0110147125	0.0485436636
1986	0.4413060360	0.2096383051	0.1831240672	0.1783097052	0.3941799101	-0.0110147129	0.0485436640
1987	0.4413060369	0.2096383055	0.1831240675	0.1783097054	0.3941799109	-0.0110147130	0.0485436641
1988	0.4413060372	0.2096383056	0.1831240676	0.1783097055	0.3941799112	-0.0110147130	0.0485436641
1989	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799112	-0.0110147130	0.0485436641
1990	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1991	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1992	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1993	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1994	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1995	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1996	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1997	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1998	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
1999	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641

Simulation Result of OLG Model With Social Security (with theta=0.11)

Time,t	Wages	Young_Consumption	Saving	Capital_Next_Period	Old_Consumption	Lambda	Contribution
2000	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2001	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2002	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2003	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2004	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2005	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2006	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2007	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2008	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2009	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2010	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2011	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2012	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2013	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2014	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2015	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2016	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2017	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2018	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2019	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641
2020	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	-0.0110147130	0.0485436641

Simulations Result of OLG Model With Social Security (changing theta)

Time,t	Wage	Young_Consumption	Saving	Capital_Next_Period	Old_Consumption	Theta	Lambda	Contribution
2000	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2001	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2002	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2003	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2004	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2005	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2006	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2007	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2008	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2009	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2010	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2011	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2012	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2013	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2014	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2015	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2016	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2017	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2018	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2019	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
2020	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641

Simulations Result Of OLG Model With Social Security (changing theta)

Time,t	Wage	Young_Consumption	Saving	Capital_Next_Period	Old_Consumption	Theta	Lambda	Contribution
1970	0.2128183168	0.1064091584	0.1064091584	0.1036116440	0.0109282206	0.05	0.0000000000	0.0106409158
1971	0.3545852039	0.1756629254	0.1682813627	0.1638572178	0.2806852534	0.05	-0.0016296766	0.0177292602
1972	0.4132702006	0.2030078043	0.1925331361	0.1874714081	0.3621554006	0.05	-0.0036272960	0.0206635100
1973	0.4327012358	0.2118000723	0.2002376535	0.1949733724	0.3922052782	0.05	-0.0045505456	0.0216350618
1974	0.4387067827	0.2144876578	0.2025840630	0.1972580945	0.4014780284	0.05	-0.0048657335	0.0219353391
1975	0.4405246481	0.2152983012	0.2032910077	0.1979464535	0.4042758125	0.05	-0.0049640228	0.0220262324
1976	0.4410714751	0.2167457361	0.2022995067	0.1969810191	0.4096461393	0.06	-0.0037900015	0.0264642885
1977	0.4412356556	0.2146144264	0.2001569407	0.1948947816	0.4076361009	0.06	-0.0060034014	0.0264741393
1978	0.4412849216	0.2146358230	0.2001749593	0.1949123265	0.4035638861	0.06	-0.0060066378	0.0264770953
1979	0.4412997025	0.2146422423	0.2001803650	0.1949175900	0.4035849062	0.06	-0.0060076090	0.0264779822
1980	0.4413041369	0.2146441680	0.2001819867	0.1949191691	0.4035912121	0.06	-0.0060079004	0.0264782482
1981	0.4413054672	0.2182603139	0.1965669051	0.1913991286	0.4171897254	0.09	-0.0023924197	0.0397174920
1982	0.4413058663	0.2116409121	0.1899474622	0.1849537120	0.4103920012	0.09	-0.0090120211	0.0397175280
1983	0.4413059860	0.2116409601	0.1899474979	0.1849537468	0.3979454572	0.09	-0.0090120329	0.0397175387
1984	0.4413060219	0.2116409746	0.1899475086	0.1849537572	0.3979454960	0.09	-0.0090120364	0.0397175420
1985	0.4413060327	0.2116409789	0.1899475119	0.1849537603	0.3979455077	0.09	-0.0090120375	0.0397175429
1986	0.4413060360	0.2116409802	0.1899475128	0.1849537613	0.3979455111	0.09	-0.0090120378	0.0397175432
1987	0.4413060369	0.2116409806	0.1899475131	0.1849537616	0.3979455122	0.09	-0.0090120379	0.0397175433
1988	0.4413060372	0.2116409807	0.1899475132	0.1849537616	0.3979455125	0.09	-0.0090120379	0.0397175433
1989	0.4413060373	0.2116409807	0.1899475132	0.1849537617	0.3979455126	0.09	-0.0090120379	0.0397175434
1990	0.4413060373	0.2116409807	0.1899475132	0.1849537617	0.3979455126	0.09	-0.0090120379	0.0397175434
1991	0.4413060373	0.2116409807	0.1899475132	0.1849537617	0.3979455126	0.09	-0.0090120379	0.0397175434
1992	0.4413060373	0.2116409807	0.1899475132	0.1849537617	0.3979455126	0.09	-0.0090120379	0.0397175434
1993	0.4413060373	0.2128461734	0.1887423206	0.1837802538	0.4024777256	0.10	-0.0078068453	0.0441306037
1994	0.4413060373	0.2106396432	0.1865357904	0.1816317336	0.4002116191	0.10	-0.0100133755	0.0441306037
1995	0.4413060373	0.2106396432	0.1865357904	0.1816317336	0.3960627120	0.10	-0.0100133755	0.0441306037
1996	0.4413060373	0.2118448358	0.1853305978	0.1804582257	0.4005949250	0.11	-0.0088081828	0.0485436641
1997	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3983288185	0.11	-0.0110147130	0.0485436641
1998	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641
1999	0.4413060373	0.2096383056	0.1831240676	0.1783097055	0.3941799113	0.11	-0.0110147130	0.0485436641

APPENDIX III

Table 6.4: Simulations Result Of OLG Model With Social Security (changing population growth rate)

Time,t	Wages	Young_Consumption	Savings	Capital_Next_Period	Old_Consumption	Pop_Gwt	Contribution
1	0.2128183168	0.1064091584	0.1064091584	0.0357780212	0.0696248674	1.974	0.0234100149
2	0.2577406593	0.1246560087	0.1096746357	0.0507791442	0.4961690119	1.160	0.0283514725
3	0.3004814559	0.1470410150	0.1250889684	0.0596352507	0.4157145640	1.098	0.0330529601
4	0.3174092327	0.1544441244	0.1299121482	0.0637750878	0.4337812719	1.037	0.0349150156
5	0.3255182171	0.1583703274	0.1322328740	0.0649143538	0.4354778553	1.037	0.0358070039
6	0.3279910710	0.1598053520	0.1323787151	0.0631105841	0.4405476670	1.098	0.0360790178
7	0.3258613550	0.1576158205	0.1321665167	0.0668116862	0.4397468689	0.978	0.0358447491
8	0.3309925324	0.1616007900	0.1335469933	0.0636675522	0.4361669694	1.098	0.0364091786
9	0.3267530962	0.1579836400	0.1323602776	0.0669096346	0.4416797374	0.978	0.0359428406
10	0.3312640074	0.1613103704	0.1340107965	0.0657871525	0.4341156955	1.037	0.0364390408
11	0.3297172788	0.1613691467	0.1319090914	0.0593145747	0.4475633007	1.224	0.0362689007
12	0.3206989670	0.1559589772	0.1284710892	0.0577686340	0.4549275821	1.224	0.0352768864
13	0.3180418839	0.1552399316	0.1275250659	0.0556931929	0.4514395886	1.290	0.0349846072
14	0.3144823706	0.1528292938	0.1266684696	0.0569580635	0.4519442563	1.224	0.0345930608
15	0.3161796689	0.1540535331	0.1275330750	0.0573468442	0.4467723508	1.224	0.0347797636
16	0.3166906424	0.1546644790	0.1272463999	0.0555714929	0.4507950578	1.290	0.0348359707
17	0.3140809376	0.1530468003	0.1261981666	0.0551137048	0.4540400424	1.290	0.0345489031
18	0.3133022278	0.1523326499	0.1264206747	0.0568466394	0.4499115353	1.224	0.0344632451
19	0.3158232467	0.1539023849	0.1274576168	0.0573129134	0.4466009500	1.224	0.0347405571
20	0.3165835007	0.1538414683	0.1280014752	0.0592644354	0.4462156268	1.160	0.0348241851
21	0.3196018448	0.1552407102	0.1295369495	0.0617557931	0.4409708847	1.098	0.0351562029
22	0.3233382147	0.1573237766	0.1308582352	0.0623857064	0.4397607187	1.098	0.0355672036
23	0.3244676203	0.1586029029	0.1302975138	0.0585899087	0.4463258560	1.224	0.0356914382
24	0.3191585314	0.1553118148	0.1281552783	0.0576266257	0.4526806261	1.224	0.0351074385
25	0.3175828095	0.1550446290	0.1274307420	0.0556519995	0.4512290603	1.290	0.0349341090
26	0.3143461208	0.1535573306	0.1258546812	0.0533836336	0.4565054996	1.358	0.0345780733
27	0.3106512461	0.1493141981	0.1267589747	0.0640781119	0.4447854277	0.978	0.0341716371
28	0.3262798605	0.1588195782	0.1332886452	0.0673789350	0.4235029141	0.978	0.0358907847
29	0.3311200037	0.1612497126	0.1339795064	0.0657717920	0.4368402366	1.037	0.0364232004
30	0.3296742729	0.1601135623	0.1331375102	0.0653584482	0.4407618835	1.037	0.0362641700

Table 6.5: Simulations Result Of OLG Model With Social Security (30 yr-generation)

Time,t	Wages	Young_Consumption	Savings	Capital_Next_Period	Old_Consumption	Pop_Gwt	Theta	Contribution
1	0.2128183168	0.1064091584	0.1064091584	0.0357780212	0.0316476670	1.974	0.05	0.0106409158
2	0.2577406593	0.1269547292	0.1201450142	0.0556269092	0.4627683550	1.160	0.05	0.0128870330
3	0.3004814559	0.1487863130	0.1388081100	0.0661757511	0.4109661928	1.098	0.05	0.0150240728
4	0.3174092327	0.1567680291	0.1456171308	0.0714848105	0.4347613867	1.037	0.05	0.0158704616
5	0.3255182171	0.1607642080	0.1488835474	0.0730883250	0.4395192282	1.037	0.05	0.0162759109
6	0.3279910710	0.1620909067	0.1496242535	0.0713322684	0.4452127781	1.098	0.05	0.0163995536
7	0.3258613550	0.1616716199	0.1477901815	0.0747096275	0.4555662334	0.978	0.06	0.0195516813
8	0.3309925324	0.1633714610	0.1480693901	0.0705909986	0.4439852348	1.098	0.06	0.0198595519
9	0.3267530962	0.1604349619	0.1464585824	0.0740364889	0.4496586857	0.978	0.06	0.0196051858
10	0.3312640074	0.1632747492	0.1483840725	0.0728431281	0.4387092005	1.037	0.06	0.0198758404
11	0.3297172788	0.1629552797	0.1468861587	0.0660492006	0.4502528331	1.224	0.06	0.0197830367
12	0.3206989670	0.1617030102	0.1392129200	0.0625988327	0.4834089557	1.224	0.09	0.0288629070
13	0.3180418839	0.1559273880	0.1332515888	0.0581941000	0.4679228481	1.290	0.09	0.0286237695
14	0.3144823706	0.1536314559	0.1322271451	0.0594575916	0.4547967640	1.224	0.09	0.0283034134
15	0.3161796689	0.1547874061	0.1330888495	0.0598450677	0.4489211373	1.224	0.09	0.0284561702
16	0.3166906424	0.1553337230	0.1329007492	0.0580408801	0.4524552896	1.290	0.09	0.0285021578
17	0.3140809376	0.1537729218	0.1318058579	0.0575627154	0.4563170326	1.290	0.09	0.0282672844
18	0.3133022278	0.1531178252	0.1319171182	0.0593181841	0.4525629764	1.224	0.09	0.0281972005
19	0.3158232467	0.1546313373	0.1329947089	0.0598027362	0.4486118502	1.224	0.09	0.0284240922
20	0.3165835007	0.1546506105	0.1335087980	0.0618143152	0.4486575138	1.160	0.09	0.0284925151
21	0.3196018448	0.1560698397	0.1350394900	0.0643790891	0.4433633262	1.098	0.09	0.0287641660
22	0.3233382147	0.1581138367	0.1364602120	0.0650564079	0.4417075419	1.098	0.09	0.0291004393
23	0.3244676203	0.1592630679	0.1361041131	0.0612009188	0.4476032857	1.224	0.09	0.0292020858
24	0.3191585314	0.1573221030	0.1326343426	0.0596406930	0.4622768729	1.224	0.10	0.0319158531
25	0.3175828095	0.1553852450	0.1302817114	0.0568970848	0.4569319833	1.290	0.10	0.0317582809
26	0.3143461208	0.1538860333	0.1287018065	0.0545912954	0.4574840728	1.358	0.10	0.0314346121
27	0.3106512461	0.1508859287	0.1283307053	0.0648726397	0.4533182806	0.978	0.11	0.0341716371
28	0.3262798605	0.1588195782	0.1332886452	0.0673789350	0.4278737388	0.978	0.11	0.0358907847
29	0.3311200037	0.1612497126	0.1339795064	0.0657717920	0.4368402366	1.037	0.11	0.0364232004
30	0.3296742729	0.1601135623	0.1331375102	0.0653584482	0.4407618835	1.037	0.11	0.0362641700

Appendix VI : EPF Contribution Rates for Malaysia, 1952-1999.

Effective		Rate (%)		Total(%)
From	To	Employee	Employer	
1.7.1952	31.7.1975	5	5	10
1.8.1975	30.11.1980	6	7	13
1.12.1980	1.12.1992	9	11	20
1.1.1993	31.12.1995	10	12	22
1.1.1996	Till now	11	12	23

Source: *Employees Provident Fund website*
(http://www.yellowpages.com.my/financial/epf.html)

Appendix VII : EPF Dividend Rates for Malaysia, 1953-1999.

Year	Annual Percentage (%)
1953 - 1959	2.50
1960 - 1962	4.00
1963	5.00
1964	5.25
1965 - 1967	5.50
1968 - 1970	5.75
1971	5.80
1972 - 1973	5.85
1974 - 1975	6.60
1976 - 1978	7.00
1979	7.25
1980 - 1982	8.00
1983 - 1987	8.50
1988 - 1994	8.00
1995	7.50
1996	7.70
1997 - 1998	6.70
1999	6.84

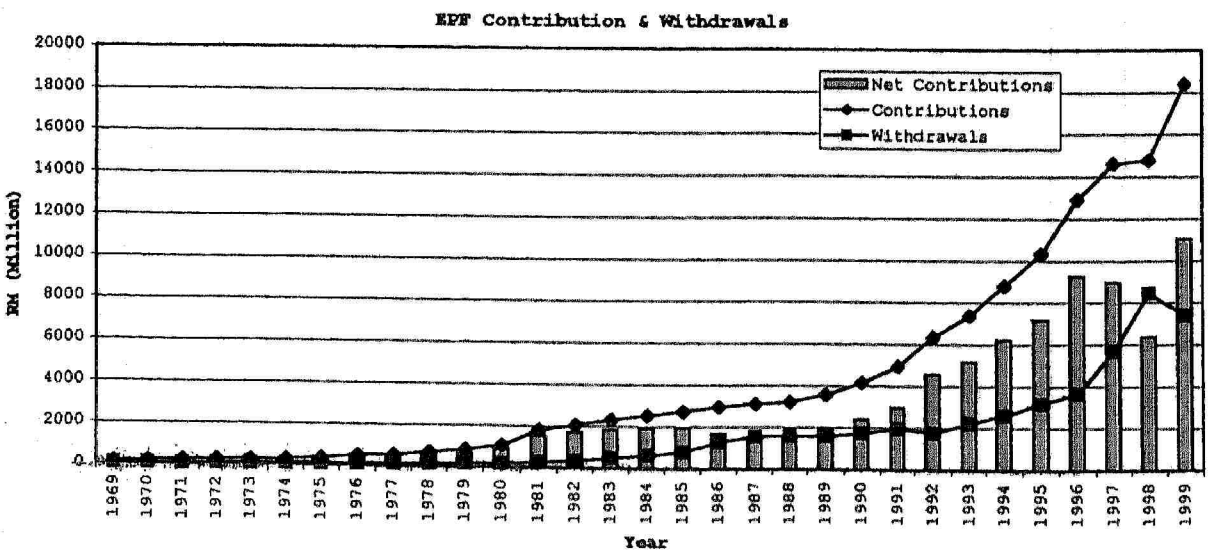
Source: *Employees Provident Fund website*
(http://www.yellowpages.com.my/financial/epf.html)

Employees Provident Fund 1									
	During the period (RM million) 2			End of Period					
				Total 3		Investments (at book value in RM million)			
Year	Contributions (RM million)	Withdrawals (RM million)	Net Contributions (RM million)	Accumulated Contributions (RM million)	Number of Contributors (million)	Total	Federal 4 Government Securities	Other 5 Malaysian Investments	Foreign Securities
1969	160	82	78	1918	1.95	1981	1831	103	46.8
1970	207	73	134	2149	2.10	2218	2062	110	46.7
1971	246	63	183	2454	2.22	2532	2384	113	34.5
1972	284	68	216	2823	2.37	2882	2735	112	34.5
1973	292	79	213	3195	2.54	3273	3117	122	34.6
1974	303	93	210	3607	2.71	3699	3471	193	34.6
1975	378	102	276	4108	2.89	4212	3949	228	34.6
1976	509	132	377	4769	2.99	4868	4587	246	34.6
1977	567	128	439	5575	3.12	5715	5427	269	34.7
1978	705	146	559	6522	3.32	6698	6369	311	18.7
1979	832	185	647	7648	3.54	7825	7450	357	18.7
1980	1068	199	869	9129	3.76	9261	8582	679	18.8
1981	1807	247	1560	11470	3.83	11523	10315	1208	0.4
1982	2058	366	1692	14052	4.19	14118	12469	1649	0.4
1983	2313	494	1819	17028	4.38	16975	14416	2559	0.7
1984	2510	610	1900	20329	4.64	20256	17200	3057	0.7
1985	2730	783	1947	23967	4.80	23854	20515	3337	0.7
1986	2950	1283	1667	27607	4.84	27473	23540	3931	1.6
1987	3098	1553	1545	31515	5.04	31266	27913	3351	1.6
1988	3205	1589	1616	35682	5.28	35434	31232	4200	1.6
1989	3566	1584	1982	40515	5.57	40250	34108	6141	1.6
1990	4139	1738	2401	46179	5.94	45642	36129	9511	1.6
1991	4922	1967	2955	52838	6.34	51997	38276	13720	1.6
1992	6317	1761	4556	61707	6.62	60863	39637	21224	1.6
1993	7376	2205	5171	71907	6.94	71529	39265	32264	1.6
1994	8792	2592	6200	83987	7.28	83309	40271	42663	375.4
1995	10324	3160	7164	97540	7.76	96600	39150	57082	368.3
1996	12899	3638	9261	114187	8.05	115217	38754	76050	412.9
1997	14614	5679	8935	130864	8.27	129380	38068	90899	413.9
1998	14782	8441	6341	145894	8.50	145808	45670	99654	484.0
1999	18406	7368	11038	156930	9.53	163804	51813	111242	749.5

ource: 1969-1974: Bank Negara Malaysia Monthly Statistics, Nov 1984.
1975-1999: Employees Provident Fund.

emark:

) Include Employees Provident Fund of Sabah and Sarawak which commenced receiving contributions from October 1969 onwards.
) Monthly and quarterly figures do not necessarily add up to the adjusted annual figures.
) Annual figures include interest.
) Exclude Treasury bills but include Federal Government Securities issued outside Malaysia and advance subscriptions.
) Include State and local government securities and loans.

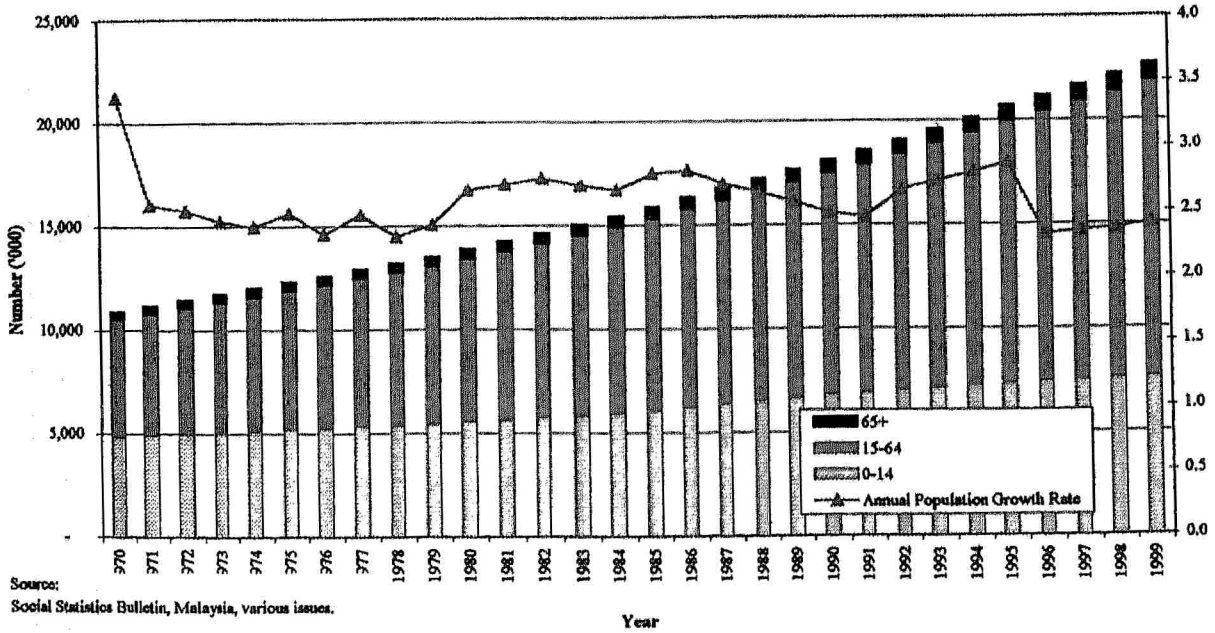


Populations Estimates by Age Group, 1970-1999, MALAYSIA.

Year	Age Group						Total ('000)	Population Grotwh Rate	Age-Dependency Ratio
	Young 0-14 ('000)	(%) 0-14	(defined as 'Working Age') Adult 15-64 ('000)	(%) 15-64	(defined as 'Retired Group') Old 65+ ('000)	(%) 65+			
1970	4,847	44.5	5,677	52.2	357	3.3	10,881	3.4	91.7
1971	4,905	44.0	5,876	52.7	379	3.4	11,160	2.6	89.9
1972	4,975	43.5	6,077	53.1	389	3.4	11,441	2.5	88.3
1973	5,038	43.0	6,276	53.5	406	3.5	11,720	2.4	86.7
1974	5,100	42.5	6,477	54.0	424	3.5	12,001	2.4	85.3
1975	5,171	42.0	6,687	54.4	443	3.6	12,301	2.5	84.0
1976	5,227	41.5	6,903	54.8	458	3.6	12,588	2.3	82.4
1977	5,302	41.1	7,136	55.3	463	3.6	12,901	2.5	80.8
1978	5,365	40.6	7,361	55.8	474	3.6	13,200	2.3	79.3
1979	5,436	40.2	7,596	56.2	486	3.6	13,518	2.4	78.0
1980	5,543	39.9	7,846	56.5	491	3.5	13,880	2.7	76.9
1981	5,622	39.4	8,126	57.0	509	3.6	14,257	2.7	75.4
1982	5,724	39.1	8,400	57.3	527	3.6	14,651	2.8	74.4
1983	5,819	38.7	8,686	57.7	543	3.6	15,048	2.7	73.2
1984	5,934	38.4	8,957	58.0	559	3.6	15,450	2.7	72.5
1985	6,081	38.3	9,227	58.1	574	3.6	15,882	2.8	72.1
1986	6,224	38.1	9,515	58.3	591	3.6	16,330	2.8	71.6
1987	6,370	38.0	9,795	58.4	609	3.6	16,774	2.7	71.3
1988	6,512	37.8	10,081	58.5	626	3.6	17,219	2.7	70.8
1989	6,650	37.6	10,370	58.7	643	3.6	17,663	2.6	70.3
1990	6,775	37.4	10,669	58.9	659	3.6	18,103	2.5	69.7
1991	6,900	37.2	10,972	59.2	676	3.6	18,548	2.5	69.0
1992	7,014	36.8	11,338	59.5	691	3.6	19,043	2.7	68.0
1993	7,126	36.4	11,729	60.0	709	3.6	19,564	2.7	66.8
1994	7,232	36.0	12,150	60.4	730	3.6	20,112	2.8	65.5
1995	7,331	35.4	12,602	60.9	756	3.7	20,689	2.9	64.2
1996	7,399	35.0	12,993	61.4	777	3.7	21,169	2.3	62.9
1997	7,475	34.5	13,389	61.8	802	3.7	21,666	2.3	61.8
1998	7,547	34.0	13,803	62.2	829	3.7	22,179	2.4	60.7
1999	7,618	33.5	14,234	62.7	860	3.8	22,712	2.4	59.6

Source: Social Statistic Bulletin, Malaysia, 1999

Population Estimates by Age Group, 1970-1999, MALAYSIA.



Source:
Social Statistics Bulletin, Malaysia, various issues.

APPENDIX X

Calculation of Current Capital Per Worker, Malaysia, 1970-1999.

Year	Nominal Gross Domestic Product (GDP) Current Prices * (RM million)	Real Gross Domestic Product Constant Prices (1987=100) * (RM million) (A)	Working Population (aged 15-64) ** ('000) (B)	Real GDP per worker (A) / (B) = (C)	Capital Output Ratio *** (D)	Current Capital per Worker (C) x (D)
1970	11,829	26,817	5,677	4,724	4:1	18,895
1971	12,955	29,508	5,876	5,022	4:1	20,087
1972	14,220	32,278	6,077	5,312	4:1	21,246
1973	18,723	36,055	6,276	5,745	4:1	22,980
1974	22,858	39,055	6,477	6,030	4:1	24,119
1975	22,332	39,367	6,687	5,887	4:1	23,548
1976	28,085	43,920	6,903	6,362	4:1	25,450
1977	32,340	47,325	7,136	6,632	4:1	26,527
1978	37,886	50,474	7,361	6,857	4:1	27,428
1979	46,424	55,193	7,596	7,266	4:1	29,064
1980	53,308	59,300	7,846	7,558	5:1	37,790
1981	57,613	63,417	8,126	7,804	5:1	39,021
1982	62,599	67,206	8,400	8,001	5:1	40,004
1983	70,444	71,386	8,686	8,219	5:1	41,093
1984	79,550	76,927	8,957	8,588	5:1	42,942
1985	77,470	76,062	9,227	8,243	5:1	41,217
1986	71,594	76,939	9,515	8,086	5:1	40,430
1987	81,085	81,085	9,795	8,278	5:1	41,391
1988	92,370	89,143	10,081	8,843	5:1	44,213
1989	105,233	97,218	10,370	9,375	5:1	46,875
1990	119,081	105,977	10,669	9,933	6:1	59,599
1991	135,123	116,093	10,972	10,581	6:1	63,485
1992	150,682	126,408	11,338	11,149	6:1	66,894
1993	172,193	138,916	11,729	11,844	6:1	71,063
1994	195,460	151,714	12,150	12,487	6:1	74,920
1995	222,472	166,625	12,602	13,222	6:1	79,333
1996	253,733	183,292	12,993	14,107	6:1	84,642
1997	281,888	196,714	13,389	14,692	6:1	88,153
1998	284,473	182,221	13,803	13,202	6:1	79,209
1999	300,349	192,794	14,234	13,545	6:1	81,268

Sources:

* Department of Statistics, Malaysia Economic Statistics - Time Series, 1999.
* Ministry of Finance, Economic Report, 2000/2001.
* Bank Negara Malaysia, Annual Report 2000.
** Social Statistical Bulletin, various issues.
*** *http://www.ilo.org/public/english/standards/relm/gb/docs/gb274/gb-4-2.htm*

APPENDIX XI

An Overview of Malaysia's Senior Citizens

Past, Present and Future Trends of Senior Citizens, Malaysia, 1960-2020

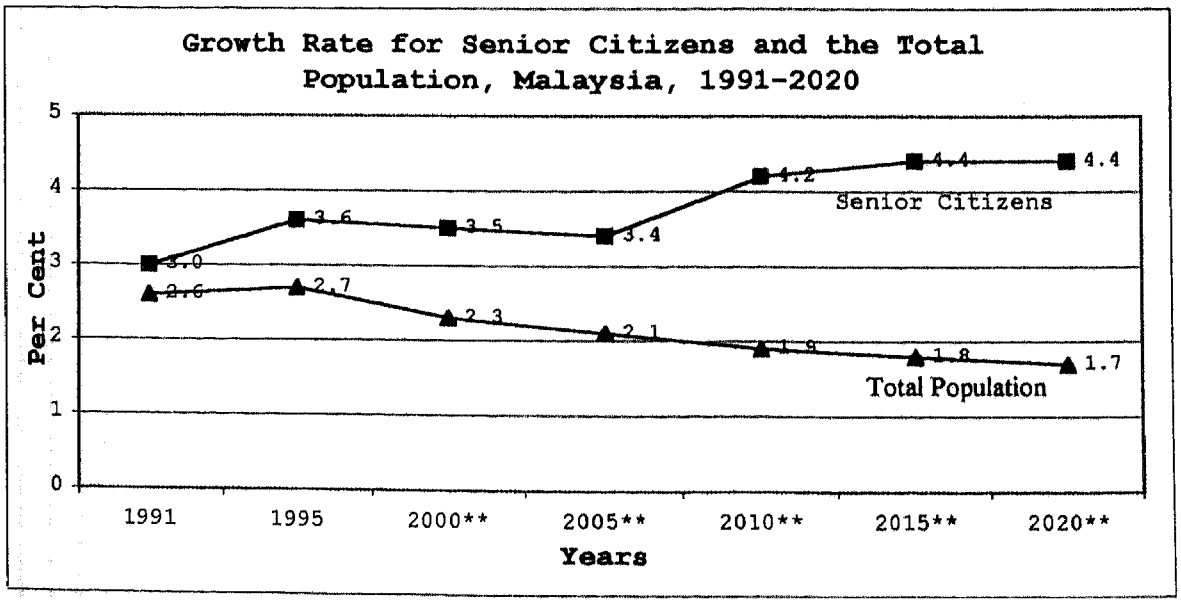
Year	Number of Senior Citizens ('000)	Per Cent of Total Population	Growth Rate of Elderly Population
1960*	386.6	4.8	-
1970	546.1	5.2	3.5
1980	745.2	5.7	3.1
1991	1,032.3	5.9	3.0
2000**	1,418.2	6.1	3.5
2010**	2,076.1	7.3	3.8
2020**	3,209.8	9.5	4.4

* Estimate
** Projections

Growth Rates for Senior Citizens and the Total Population, Malaysia, 1991-2020

Year	Growth Rate for	
	Senior Citizens	Total Population
1991	3.0	2.6
1995	3.6	2.7
2000**	3.5	2.3
2005**	3.4	2.1
2010**	4.2	1.9
2015**	4.4	1.8
2020**	4.4	1.7

** Projections



APPENDIX XII

Matlab Scripts

~function basesimulation_table

~function basesimulationSS_table

~function SSthetachange_table

~function SSpopchange_table

~function SSpopthetachange_table

```
function basesimulation_table;

%  basesimulation_table - A function file to Simulates the OLG model
%  Without Social Security introduced in the paper
%
%  Main Input (1): Annual Population Growth Rate, n=0.027 (constant)
%
%  Output (1): Table 6.1:  Simulations Results Of OLG Model Without
%                  Social Security (Assume k(1)=0.018896)
%  Output (2): Figure 6.1
%
%  File written by Ong Bee Bee (EGA 99026).
%  Research Paper Title is Overlapping Generations Model (OLG)
%  Simulations of Social Security In Malaysia
%  Research Paper EXGA2180, March 2001
%  Faculty of Economics and Administration, University of Malaya
%  50603 Kuala Lumpur, Malaysia.
%  Author: Ong Bee Bee (obb9@hotmail.com)
%  Last update: March 12, 2001



global alpha
global beta
global annualgwt
global k
global i


%  Assume coefficients for beta and alpha as 0.5 and 0.3 respectively.
beta=0.50;      %  See Equation (4.2)
alpha=0.30;     %  See Equation (4.16)

year=1969;      % Print time 1 as year 1970
annualgwt=0.027;  % Constant annual population growth rate (2.7 per
cent)
t=1;     % t is the number of years in a period
n = -1+((1+annualgwt).^t); %  Population growth rate per period


%  Table 6.1 is written in a file named 'simtable.table'.
   fid = fopen ('simtable.table','w');
   fprintf(fid, '    Table 6.1:  Simulations Result Of OLG Model Without
Social Security  (Assume k(1)=0.01181569)\n\n\n');
   fprintf(fid,'Time,t    Output      Interest_Rate       Wages
Young_Consumption     Savings       Capital_Next_Period
Old_Consumption\n\n');


%  Define initial value of k and s, with and without social security
%  Figure 6.1(a):k(1)=18896   See explanation in Chapter 6
%  Figure 6.1(b) onwards:k(1)=0.018896

k(1)=0.018896; % Initial capital is RM0.018896million or RM 18896
s(1)=0;

for i=1:31;     %  Create a for loop to simulate the OLG model over time

      output(i+1)=k(i).^alpha;
      r(i+1)=alpha.*output(i+1)./k(i);
      w(i+1)=(1-alpha).*output(i+1);
```

```
y(i+1)=beta.*w(i+1);
(i+1)=w(i+1)-cy(i+1);
(i+1)=s(i+1)./(1+n);
o(i+1)=(1+r(i+1)).*s(i);

  Present the ouput in Matlab Edit Window named as Table 6.1

able=[year+i;output(i+1);r(i+1);w(i+1);cy(i+1);s(i+1);k(i+1);co(i

printf(fid,' %2.0f   %2.10f   %2.10f    %2.10f    %2.10f
  %2.10f        %2.10f\n',simtable);

  Present the ouput in Matlab Command Window
printf('**********In the t=%1.0f
**********\n\n',i);
printf('Capital Stock for this period (RM million), k(%1.0f) =
\n',year+i,k(i));
printf('Productivity_Output (RM million), f(k(%1.0f)) =
\n',year+i,output(i+1));
printf('Real_Interest_Rate, r(%1.0f) = %2.4f\n\n',year+i,r(i+1));
printf('Wages (RM million), w(%1.0f) = %2.4f\n\n',year+i,w(i+1));
printf('Consumption of Young (RM million), c1(%1.0f) =
\n',year+i,cy(i+1));
printf('Consumption of Old (RM million), c2(%1.0f) =
\n',year+i,co(i+1));
printf('Savings (RM million), s(%1.0f) =
\n',year+i,s(i+1));
printf('Capital Stock in the next period (RM million), k(%1.0f) =
\n',year+i+1,k(i+1));

nd;


close(fid);

=1:31;

lot (k(i),k(i+1),'k');    %  Plot Figure 6.1 with a dark solid

label('Current Capital Stock (RM million), k_t ')
label('Capital Stock in the Next Period (RM million),
'),grid on
itle('                    Figure 6.1: Evolution of Capital Stock
: Social Security (Assume k(1)=0.018896)')
gtext('Annual Population Growth Rate, annualgwt=0.027 (constant)')
gtext('Beta fixed at 0.50')
gtext('Alpha fixed at 0.30')
```

```
n basesimulationSS_table;

asesimulationSS_table - A function file to Simulates the OLG
odel With Social Security introduced in the paper

ain Input (1): Annual Population Growth Rate, n=0.027 (constant
t 2.7%)
ain Input (2): Social Security Contribution Rate, theta=0.11
constant at 11%)

utput (1): Table 6.2:  Simulations Results Of OLG Model With
           Social Security (with theta constant)
utput (2): Figure
.2(a),6.3(a),6.4(a),6.5(a),6.6(a),6.7(a),6.8(a)and 6.9(a).

ile written by Ong Bee Bee (EGA 99026).
esearch Paper Title is Overlapping Generations Model (OLG)
imulations of Social Security In Malaysia
esearch Paper EXGA2180, March 2001
aculty of Economics and Administration, University of Malaya
0603 Kuala Lumpur, Malaysia.
uthor: Ong Bee Bee (obb9@hotmail.com)
ast update: March 14, 2001


alpha
beta
annualgwt
theta
k
i

.30;
50;

69;         % Print time 1 as year 1970
wt=0.027;
           % t is the number of years in a period
((1+annualgwt).^t);  % n is the population growth rate per period
.11;    % Constant social security contribution rate (11%)

open ('simtableSS.table','w');
ntf(fid, '    Table 6.2:  Simulations Result Of OLG Model With
Security (with theta=0.11)\n');
ntf(fid,' Time,t   Wages   Young_Consumption   Saving
_Next_Period  Old_Consumption   Lambda   Contribution\n');


018896;
0.018896;

0;


:31;

ut(i+1)=k(i).^alpha;
1)=alpha.*output(i+1)./k(i);
1)=(1-alpha).*output(i+1);
+1)=beta.*w(i+1);
1)=w(i+1)-cy(i+1);
```

```
k(i+1)=s(i+1)./(1+n);
co(i+1)=(1+r(i+1)).*s(i);
cor(i+1)=k(i)./output(i+1);


    d(i+1)=theta.*w(i+1);

    if (i==1)
       coeff=0;
    else
       coeff=1;
    end

    lambda(i)=coeff.*beta.*(d(i+1).*(1+n)./(1+r(i+1))-d(i));

    cyss(i+1)=(cy(i+1)+lambda(i));
    sss(i+1)=w(i+1)-cyss(i+1)-d(i);
    kss(i+1)=sss(i+1)./(1+n);
    coss(i+1)=(1+r(i+1)).*sss(i)+(1+n).*d(i+1);

    outputss(i+1)=kss(i).^alpha;
    rss(i+1)=alpha.*outputss(i+1)./kss(i);
    wss(i+1)=(1-alpha).*outputss(i+1);
    corss(i+1)=kss(i)./outputss(i+1);


Lmtable=[year+i;w(i+1);cyss(i+1);sss(i+1);kss(i+1);coss(i+1);lambda(i);
(i+1)];
  fprintf(fid,'%2.0f  %2.10f    %2.10f   %2.10f    %2.10f    %2.10f
2.10f   %2.10f   \n',simtable);

  fprintf('**********In the t=%1.0f
eriod:**********\n\n',i);
  fprintf('Capital Stock for this period (RM million), k(%1.0f) =
2.4f\n\n',year+i,k(i));
  fprintf('Productivity_Output (RM million), f(k(%1.0f)) =
2.4f\n\n',year+i,output(i+1));
  fprintf('Real_Interest_Rate, r(%1.0f) = %2.4f\n\n',year+i,r(i+1));
  fprintf('Wages (RM million), w(%1.0f) = %2.4f\n\n',year+i,w(i+1));
  fprintf('Consumption of Young (RM million), c1(%1.0f) =
2.4f\n\n',year+i,cy(i+1));
  fprintf('Consumption of Old (RM million), c2(%1.0f) =
2.4f\n\n',year+i,co(i+1));
  fprintf('Savings (RM million), s(%1.0f) = %2.4f\n\n',year+i,s(i+1));
  fprintf('Capital Stock in the next period (RM million), k(%1.0f) =
2.4f\n\n',year+i+1,k(i+1));
  fprintf('Capital-Output Ratio, k/y(%1.0f) =
2.4f\n\n',year+i,cor(i+1));

  fprintf('Consumption of Young SS (RM million), c1ss(%1.0f) =
2.4f\n\n',year+i,cyss(i+1));
  fprintf('Consumption of Old SS (RM million), c2ss(%1.0f) =
2.4f\n\n',year+i,coss(i+1));
  fprintf('Savings SS (RM million), sss(%1.0f) =
2.4f\n\n',year+i,sss(i+1));
  fprintf('Capital Stock SS in the next period (RM million), kss(%1.0f)
%2.4f\n\n',year+i+1,kss(i+1));
  fprintf('Social Security Contribution (RM million), d(%1.0f) =
2.4f\n\n',year+i,d(i+1));
  fprintf('Lambda(%1.0f) = %2.4f\n\n',year+i,lambda(i));
```

```
  fprintf('Capital-Output Ratio, k/y(%1.0f) =
:.4f\n\n',year+i,corss(i+1));

  end;

  fclose(fid);

=1:31;

Lot (k(i),k(i+1),'k--',kss(i),kss(i+1),'g');
Label('Current Capital Stock (RM million), k_t ')
Label('Capital Stock in the Next Period (RM million), k_t_+_1'),grid on
Ltle('Figure 6.2(a): Evolution of Capital Stock With or Without Social
ecurity')
egend('Without Social Security','With Social Security')
:ext('Annual Population Growth Rate, annualgwt=0.027 (constant)')
:ext('Social Security Contribution Rate, theta=0.11 (constant)')
text('Beta fixed at 0.50')
text('Alfa fixed at 0.30')


igure(2)
lot (year+i,k(i),'k--',year+i,kss(i),'g');
label('Time(t)'), ylabel('Capital Stock (RM million), k_t'),grid on
itle('Figure 6.3(a): Capital Stock versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta=0.11 (constant)')

igure(3)
lot (year+i,output(i+1),'k--',year+i,outputss(i+1),'g');
label('Time(t)'), ylabel('Productivity Output (RM million),
(k_t)'),grid on
itle('Figure 6.4(a): Productivity Output versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta=0.11 (constant)')

igure(4)
lot (year+i,s(i+1),'k--',year+i,sss(i+1),'g');
label('Time(t)'), ylabel('Savings (RM million), s_t'),grid on
itle('Figure 6.5(a): Savings versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta=0.11 (constant)')

igure(5)
lot (year+i,w(i+1),'k--',year+i,wss(i+1),'g');
label('Time(t)'), ylabel('Wages (RM million), w_t'),grid on
itle('Figure 6.6(a): Wages versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta=0.11 (constant)')

igure(6)
lot (year+i,r(i+1),'k--',year+i,rss(i+1),'g');
label('Time(t)'), ylabel('Real Interest Rate, r_t'),grid on
itle('Figure 6.7(a): Real Interest Rate versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta=0.11 (constant)')
```

```
7)
ear+i,cy(i+1),'k--',year+i,cyss(i+1),'g');
'Time(t)'), ylabel('Consumption of Young (RM million),
,grid on
 Figure 6.8(a): Consumption of Young versus Time(t)')
'Without Social Security','With Social Security')
annualgwt=0.027 (constant)')
theta=0.11 (constant)')

8)
ear+i,co(i+1),'k--',year+i,coss(i+1),'g');
'Time(t)'), ylabel('Consumption of Old (RM million),
_1'),grid on
 Figure 6.9(a): Consumption of Old versus Time(t)')
'Without Social Security','With Social Security')
annualgwt=0.027 (constant)')
theta=0.11 (constant)')
```

```
nction SSthetachange_table;

    SSthetachange_table - A function file to Simulates the OLG model
    With Social Security introduced in the paper

    Main Input (1): Annual Population Growth Rate, annualgwt=0.027
    (constant)
    Main Input (2): Social Security Contribution Rate, theta as in
    Appendix VII.

    Output (1): Table 6.3:  Simulations Results Of OLG Model With
                Social Security (with changing theta)
    Output (2): Figure
    6.2(b),6.3(b),6.4(b),6.5(b),6.6(b),6.7(b),6.8(b)and 6.9(b).

    File written by Ong Bee Bee (EGA 99026).
    Research Paper Title is Overlapping Generations Model (OLG)
    Simulations of Social Security In Malaysia
    Research Paper EXGA2180, March 2001
    Faculty of Economics and Administration, University of Malaya
    50603 Kuala Lumpur, Malaysia.


lobal alpha
lobal beta
lobal annualgwt
lobal theta
lobal k
lobal i

lpha=0.30;
eta=0.50;

nnualgwt=0.027;  % annual population growth rate
ear=1969;
=1;     % t is the number of years in a period
 = -1+((1+annualgwt).^t); %population growth rate per period


  fid = fopen ('simtableSStheta.table','w');
  fprintf(fid, '    Table 6.3:  Simulations Result Of OLG Model With
ocial Security (changing theta)\n');
  fprintf(fid,' Time,t   Wages     Young_Consumption   Savings
apital_Next_Period  Old_Consumption  Theta   Lambda   Contribution\n');

(1)=0.018896;
ss(1)=0.018896;
(1)=0;
ss(1)=0;
(1)=0;

or i=1:31;

  output(i+1)=k(i).^alpha;
  r(i+1)=alpha.*output(i+1)./k(i);
  w(i+1)=(1-alpha).*output(i+1);
  cy(i+1)=beta.*w(i+1);
  s(i+1)=w(i+1)-cy(i+1);
  k(i+1)=s(i+1)./(1+n);
  co(i+1)=(1+r(i+1)).*s(i);
  cor(i+1)=k(i)./output(i+1);
```

```
      if (i>=1) & (i<=6)
         theta(i+1)=0.05;
      elseif (i>=7) & (i<=11)
         theta(i+1)=0.06;
      elseif (i>=12) & (i<=23)
         theta(i+1)=0.09;
      elseif (i>=24) & (i<=26)
         theta(i+1)=0.10;
      else
         theta(i+1)=0.11;
      end


      d(i+1)=theta(i+1).*w(i+1);

      if (i==1)
         coeff=0;
      else
         coeff=1;
      end

      lambda(i)=coeff.*beta.*(d(i+1).*(1+n)./(1+r(i+1))-d(i));

      cyss(i+1)=(cy(i+1)+lambda(i));
      sss(i+1)=w(i+1)-cyss(i+1)-d(i);
      kss(i+1)=sss(i+1)./(1+n);
      coss(i+1)=(1+r(i+1)).*sss(i)+(1+n).*d(i+1);

      outputss(i+1)=kss(i).^alpha;
      rss(i+1)=alpha.*outputss(i+1)./kss(i);
      wss(i+1)=(1-alpha).*outputss(i+1);
      corss(i+1)=kss(i)./outputss(i+1);



simtableSStheta=[year+i;w(i+1);cyss(i+1);sss(i+1);kss(i+1);coss(i+1);the
ta(i+1);lambda(i);d(i+1)];
   fprintf(fid,'%2.0f  %2.10f  %2.10f    %2.10f  %2.10f      %2.10f
%2.2f %2.10f  %2.10f\n',simtableSStheta);

   fprintf('**********************In the t=%1.0f
period:**********************\n\n',i);
   fprintf('Capital Stock for this period (RM million), k(%1.0f) =
%2.4f\n\n',year+i,k(i));
   fprintf('Productivity_Output (RM million), f(k(%1.0f)) =
%2.4f\n\n',year+i,output(i+1));
   fprintf('Real_Interest_Rate, r(%1.0f) = %2.4f\n\n',year+i,r(i+1));
   fprintf('Wages (RM million), w(%1.0f) = %2.4f\n\n',year+i,w(i+1));
   fprintf('Consumption of Young (RM million), c1(%1.0f) =
%2.4f\n\n',year+i,cy(i+1));
   fprintf('Consumption of Old (RM million), c2(%1.0f) =
%2.4f\n\n',year+i,co(i+1));
   fprintf('savings (RM million), s(%1.0f) = %2.4f\n\n',year+i,s(i+1));
   fprintf('Capital Stock in the next period (RM million), k(%1.0f) =
%2.4f\n\n',year+i+1,k(i+1));
   fprintf('Capital-Output Ratio, k/y(%1.0f) =
%2.4f\n\n',year+i,cor(i+1));
```

```
ntf('Consumption of Young SS (RM million), c1ss(%1.0f) =
\n',year+i,cyss(i+1));
ntf('Consumption of Old SS (RM million), c2ss(%1.0f) =
\n',year+i,coss(i+1));
ntf('savings SS (RM million), sss(%1.0f) =
\n',year+i,sss(i+1));
ntf('Capital Stock SS in the next period (RM million), kss(%1.0f)
\n\n',year+i+1,kss(i+1));
ntf('Social Security Contribution (RM million), d(%1.0f) =
\n',year+i,d(i+1));
ntf('Lambda(%1.0f) = %2.4f\n\n',year+i,lambda(i));
ntf('Theta(%1.0f) = %2.4f\n\n',year+i,theta(i+1));
ntf('d1 = %2.4f\n\n',d(1));
ntf('Capital-Output Ratio, k/y(%1.0f) =
\n',year+i,corss(i+1));



se(fid);


69;


(i),k(i+1),'k--',kss(i),kss(i+1),'g');
'Current Capital Stock (RM million), k_t ')
'Capital Stock in the Next Period (RM million), k_t_+_1'),grid on
Figure 6.2(b): Evolution of Capital Stock With or Without Social
y')
'Without Social Security','With Social Security')
Annual Population Growth Rate, annualgwt=0.027 (constant)')
Social Security Contribution Rate, theta (changing)')
Beta fixed at 0.50')
alpha fixed at 0.30')


2)
ear+i,k(i),'k--',year+i,kss(i),'g');
'Time(t)'), ylabel('Capital Stock (RM million), k_t'),grid on
Figure 6.3(b): Capital Stock versus Time(t)')
'Without Social Security','With Social Security')
annualgwt=0.027 (constant)')
theta (changing)')

3)
ear+i,output(i+1),'k--',year+i,outputss(i+1),'g');
'Time(t)'), ylabel('Productivity Output (RM million),
),grid on
Figure 6.4(b): Productivity Output versus Time(t)')
'Without Social Security','With Social Security')
annualgwt=0.027 (constant)')
theta (changing)')

1)
ear+i,s(i+1),'k--',year+i,sss(i+1),'g');
'Time(t)'), ylabel('Savings (RM million), s_t'),grid on
Figure 6.5(b): Savings versus Time(t)')
'Without Social Security','With Social Security')
annualgwt=0.027 (constant)')
theta (changing)')
```

```
igure(5)
lot (year+i,w(i+1),'k--',year+i,wss(i+1),'g');
label('Time(t)'), ylabel('Wages (RM million), w_t'),grid on
itle('Figure 6.6(b): Wages versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta (changing)')

igure(6)
lot (year+i,r(i+1),'k--',year+i,rss(i+1),'g');
label('Time(t)'), ylabel('Real Interest Rate, r_t'),grid on
itle('Figure 6.7(b): Real Interest Rate versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta (changing)')

igure(7)
lot (year+i,cy(i+1),'k--',year+i,cyss(i+1),'g');
label('Time(t)'), ylabel('Consumption of Young (RM million),
_1_t'),grid on
itle(' Figure 6.8(b): Consumption of Young versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta (changing)')

igure(8)
lot (year+i,co(i+1),'k--',year+i,coss(i+1),'g');
label('Time(t)'), ylabel('Consumption of Old (RM million),
_2_t_+_1'),grid on
itle(' Figure 6.9(b): Consumption of Old versus Time(t)')
egend('Without Social Security','With Social Security')
text('annualgwt=0.027 (constant)')
text('theta (changing)')
```

```
unction SSpopchange_table;

    SSpopthetachange_table - A function file to Simulates the OLG
    model With Social Security introduced in the paper

    Main Input (1): Annual Population Growth Rate, n as Appendix IX.
    Main Input (2): Social Security Contribution Rate, theta constant
    at 11%.

    Output (1): Table 6.5:  Simulations Results Of OLG Model With
                Social Security (with constant theta & changing
                population growth rate)
    Output (2): Figure
    6.2(c),6.3(c),6.4(c),6.5(c),6.6(c),6.7(c),6.8(c) and 6.9(c).

    File written by Ong Bee Bee (EGA 99026).
    Research Paper Title is Overlapping Generations Model (OLG)
    Simulations of Social Security In Malaysia
    Research Paper EXGA2180, March 2001
    Faculty of Economics and Administration, University of Malaya
    50603 Kuala Lumpur, Malaysia.


obal alpha
obal beta
obal annualgwt
obal k
obal i


pha=0.30;
ta=0.50;

ar=0;
30;    % t is the number of years in a period
eta=0.11;

r i=1:30;
 load annualgwt.dat
 n(i) = -1+((1+annualgwt(i)).^t); %population growth rate per period
d;



d = fopen ('simtableSSpop.table','w');
 fprintf(fid, ' Table 6.4:  Simulations Result Of OLG Model With
cial Security (changing population growth rate)\n');
 fprintf(fid,'Time,t  Wages     Young_Consumption   Savings
pital_Next_Period Old_Consumption Pop_Gwt  Contribution\n');

1)=0.018896;
s(1)=0.018896;
1)=0;
s(1)=0;
1)=0;

r i=1:30;

 output(i+1)=k(i).^alpha;
 r(i+1)=alpha.*output(i+1)./k(i);
 w(i+1)=(1-alpha).*output(i+1);
```

```
cy(i+1)=beta.*w(i+1);
s(i+1)=w(i+1)-cy(i+1);
c(i+1)=s(i+1)./(1+n(i));
co(i+1)=(1+r(i+1)).*s(i);
cor(i+1)=k(i)./output(i+1);

   d(i+1)=theta(i+1).*w(i+1);

   if (i==1)
      coeff=0;
   else
      coeff=1;
   end

   lambda(i)=coeff.*beta.*(d(i+1).*(1+n(i))./(1+r(i+1))-d(i));

   cyss(i+1)=(cy(i+1)+lambda(i));
   sss(i+1)=w(i+1)-cyss(i+1)-d(i);
   kss(i+1)=sss(i+1)./(1+n(i));
   coss(i+1)=(1+r(i+1)).*sss(i)+(1+n(i)).*d(i+1);

   outputss(i+1)=kss(i).^alpha;
   rss(i+1)=alpha.*outputss(i+1)./kss(i);
   wss(i+1)=(1-alpha).*outputss(i+1);
   corss(i+1)=kss(i)./outputss(i+1);

simtableSSpop=[year+i;w(i+1);cyss(i+1);sss(i+1);kss(i+1);
coss(i+1);n(i);d(i+1)];
fprintf(fid,'%2.0f  %2.10f  %2.10f  %2.10f  %2.10f  %2.10f
              %2.3f  %2.2f  %2.10f\n',simtableSSpop);

fprintf('**********In the t=%1.0f
        period:**********\n\n',i);
fprintf('Capital Stock for this period (RM million), k(%1.0f) =
        %2.4f\n\n',year+i,k(i));
fprintf('Productivity_Output (RM million), f(k(%1.0f)) =
        %2.4f\n\n',year+i,output(i+1));
fprintf('Real_Interest_Rate, r(%1.0f) = %2.4f\n\n',year+i,r(i+1));
fprintf('Wages (RM million), w(%1.0f) = %2.4f\n\n',year+i,w(i+1));
fprintf('Consumption of Young (RM million), c1(%1.0f) =
        %2.4f\n\n',year+i,cy(i+1));
fprintf('Consumption of Old (RM million), c2(%1.0f) =
        %2.4f\n\n',year+i,co(i+1));
fprintf('Saving (RM million), s(%1.0f) =
        %2.4f\n\n',year+i,s(i+1));
fprintf('Capital Stock in the next period (RM million), k(%1.0f) =
        %2.4f\n\n',year+i+1,k(i+1));
fprintf('Capital-Output Ratio, k/y(%1.0f) =
        %2.4f\n\n',year+i,cor(i+1));

fprintf('Consumption of Young SS (RM million), c1ss(%1.0f) =
        %2.4f\n\n',year+i,cyss(i+1));
fprintf('Consumption of Old SS (RM million), c2ss(%1.0f) =
        %2.4f\n\n',year+i,coss(i+1));
fprintf('Saving SS (RM million), sss(%1.0f) =
        %2.4f\n\n',year+i,sss(i+1));
fprintf('Capital Stock SS in the next period (RM million),
        kss(%1.0f) = %2.4f\n\n',year+i+1,kss(i+1));
fprintf('Social Security Contribution (RM million), d(%1.0f) =
        %2.4f\n\n',year+i,d(i+1));
fprintf('Lambda(%1.0f) = %2.4f\n\n',year+i,lambda(i));
```

```
   fprintf('Theta(%1.0f) = %2.4f\n\n',year+i,theta);
   fprintf('Capital-Output Ratio, k/y(%1.0f) =
2.4f\n\n',year+i,corss(i+1));


nd;

   fclose(fid);


ear=0;
=1:30;

lot (k(i),k(i+1),'k--',kss(i),kss(i+1),'g');
label('Current Capital Stock (RM million), k_t ')
label('Capital Stock in the Next Period (RM million), k_t_+_1'),grid on
itle('Figure 6.2(c): Evolution of Capital Stock With or Without Social
ecurity')
egend('Without Social Security','With Social Security')
gtext('Annual Population Growth Rate, annualgwt (changing)')
gtext('Social Security Contribution Rate, theta (constant)')
gtext('beta fixed at 0.50')
gtext('alpha fixed at 0.30')


figure(2)
plot (year+i,k(i),'k--',year+i,kss(i),'g');
xlabel('Time(t)'), ylabel('Capital Stock (RM million), k_t'),grid on
title('Figure 6.3(c): Capital Stock versus Time(t)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (constant)')

figure(3)
plot (year+i,output(i+1),'k--',year+i,outputss(i+1),'g');
xlabel('Time(t)'), ylabel('Productivity Output (RM million),
f(k_t)'),grid on
title('Figure 6.4(c): Productivity Output versus Time(t)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (constant)')

figure(4)
plot (year+i,s(i+1),'k--',year+i,sss(i+1),'g');
xlabel('Time(t)'), ylabel('Savings (RM million), s_t'),grid on
title('Figure 6.5(c): Savings versus Time(t)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (constant)')

figure(5)
plot (year+i,w(i+1),'k--',year+i,wss(i+1),'g');
xlabel('Time(t)'), ylabel('Wages (RM million), w_t'),grid on
title('Figure 6.6(c): Wages versus Time(t)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (constant)')

figure(6)
plot (year+i,r(i+1),'k--',year+i,rss(i+1),'g');
xlabel('Time(t)'), ylabel('Real Interest Rate, r_t'),grid on
```

```
'Figure 6.7(c): Real Interest Rate versus Time(t)')
('Without Social Security','With Social Security')
'annualgwt (changing)')
'theta (constant)')

(7)
year+i,cy(i+1),'k--',year+i,cyss(i+1),'g');
('Time(t)'), ylabel('Consumption of Young (RM million),
),grid on
' Figure 6.8(c): Consumption of Young versus Time(t)')
('Without Social Security','With Social Security')
'annualgwt (changing)')
'theta (constant)')

(8)
year+i,co(i+1),'k--',year+i,coss(i+1),'g');
('Time(t)'), ylabel('Consumption of Old (RM million),
+_1'),grid on
' Figure 6.9(c): Consumption of Old versus Time(t)')
('Without Social Security','With Social Security')
'annualgwt (changing)')
'theta (constant)')
```

```
function SSpopthetachange_table;

%     SSpopthetachange_table - A function file to Simulates the OLG
%     model With Social Security introduced in the paper
%
%     Main Input (1): Annual Population Growth Rate, n as Appendix IX.
%     Main Input (2): Social Security Contribution Rate, theta as in
%     Appendix VII.
%
%     Output (1): Table 6.5:  Simulations Results Of OLG Model With
%                 Social Security (with changing theta & changing
%                 population growth rate)
%     Output (2): Figure
%     6.2(d),6.3(d),6.4(d),6.5(d),6.6(d),6.7(d),6.8(d) and 6.9(d).
%
%     File written by Ong Bee Bee (EGA 99026).
%     Research Paper Title is Overlapping Generations Model (OLG)
%     Simulations of Social Security In Malaysia
%     Research Paper EXGA2180, March 2001
%     Faculty of Economics and Administration, University of Malaya
%     50603 Kuala Lumpur, Malaysia.


global alpha
global beta
global annualgwt
global k
global i


alpha=0.30;
beta=0.50;

year=0;
t=30;    % t is the number of years in a period


for i=1:30;
   load annualgwt.dat
   n(i) = -1+((1+annualgwt(i)).^t); %population growth rate per period
end;



fid = fopen ('simtableSSpoptheta.table','w');
   fprintf(fid, ' Table 6.5:  Simulations Result Of OLG Model With
Social Security (30 yr-generation)\n');
   fprintf(fid,'Time,t  Wages     Young_Consumption   Savings
Capital_Next_Period Old_Consumption Pop_Gwt  Theta    Contribution\n');

k(1)=0.018896;
kss(1)=0.018896;
s(1)=0;
sss(1)=0;
d(1)=0;

for i=1:30;

   output(i+1)=k(i).^alpha;
   r(i+1)=alpha.*output(i+1)./k(i);
   w(i+1)=(1-alpha).*output(i+1);
```

```
cy(i+1)=beta.*w(i+1);
s(i+1)=w(i+1)-cy(i+1);
k(i+1)=s(i+1)./(1+n(i));
co(i+1)=(1+r(i+1)).*s(i);
cor(i+1)=k(i)./output(i+1);

   if (i>=1) & (i<=6)
      theta(i+1)=0.05;
   elseif (i>=7) & (i<=11)
      theta(i+1)=0.06;
   elseif (i>=12) & (i<=23)
      theta(i+1)=0.09;
   elseif (i>=24) & (i<=26)
      theta(i+1)=0.10;
   else
      theta(i+1)=0.11;
   end

   d(i+1)=theta(i+1).*w(i+1);

   if (i==1)
      coeff=0;
   else
      coeff=1;
   end

   lambda(i)=coeff.*beta.*(d(i+1).*(1+n(i))./(1+r(i+1))-d(i));

   cyss(i+1)=(cy(i+1)+lambda(i));
   sss(i+1)=w(i+1)-cyss(i+1)-d(i);
   kss(i+1)=sss(i+1)./(1+n(i));
   coss(i+1)=(1+r(i+1)).*sss(i)+(1+n(i)).*d(i+1);

   outputss(i+1)=kss(i).^alpha;
   rss(i+1)=alpha.*outputss(i+1)./kss(i);
   wss(i+1)=(1-alpha).*outputss(i+1);
   corss(i+1)=kss(i)./outputss(i+1);

simtableSSpoptheta=[year+i;w(i+1);cyss(i+1);sss(i+1);kss(i+1);
coss(i+1);n(i);theta(i+1);d(i+1)];
fprintf(fid,'%2.0f  %2.10f  %2.10f  %2.10f   %2.10f     %2.10f
             %2.3f  %2.2f  %2.10f\n',simtableSSpoptheta);

fprintf('**********In the t=%1.0f
      period:**********\n\n',i);
fprintf('Capital Stock for this period (RM million), k(%1.0f) =
      %2.4f\n\n',year+i,k(i));
fprintf('Productivity_Output (RM million), f(k(%1.0f)) =
      %2.4f\n\n',year+i,output(i+1));
fprintf('Real_Interest_Rate, r(%1.0f) = %2.4f\n\n',year+i,r(i+1));
fprintf('Wages (RM million), w(%1.0f) = %2.4f\n\n',year+i,w(i+1));
fprintf('Consumption of Young (RM million), c1(%1.0f) =
      %2.4f\n\n',year+i,cy(i+1));
fprintf('Consumption of Old (RM million), c2(%1.0f) =
      %2.4f\n\n',year+i,co(i+1));
fprintf('Saving (RM million), s(%1.0f) =
      %2.4f\n\n',year+i,s(i+1));
fprintf('Capital Stock in the next period (RM million), k(%1.0f) =
      %2.4f\n\n',year+i+1,k(i+1));
fprintf('Capital-Output Ratio, k/y(%1.0f) =
      %2.4f\n\n',year+i,cor(i+1));
```

```
:intf('Consumption of Young SS (RM million), c1ss(%1.0f) =
\n\n',year+i,cyss(i+1));
:intf('Consumption of Old SS (RM million), c2ss(%1.0f) =
\n\n',year+i,coss(i+1));
:intf('savings SS (RM million), sss(%1.0f) =
\n\n',year+i,sss(i+1));
:intf('Capital Stock SS in the next period (RM million), kss(%1.0f)
lf\n\n',year+i+1,kss(i+1));
:intf('Social Security Contribution (RM million), d(%1.0f) =
\n\n',year+i,d(i+1));
:intf('Lambda(%1.0f) = %2.4f\n\n',year+i,lambda(i));
:intf('Theta(%1.0f) = %2.4f\n\n',year+i,theta(i+1));
:intf('Capital-Output Ratio, k/y(%1.0f) =
\n\n',year+i,corss(i+1));



lose(fid);


0;
0;

(k(i),k(i+1),'k--',kss(i),kss(i+1),'g');
l('Current Capital Stock (RM million), k_t ')
l('Capital Stock in the Next Period (RM million), k_t_+_1'),grid on
('Figure 6.2(d): Evolution of Capital Stock With or Without Social
ity (30 years per generation)')
d('Without Social Security','With Social Security')
('Annual Population Growth Rate, annualgwt (changing)')
('Social Security Contribution Rate, theta (changing)')
('Beta fixed at 0.50')
('alpha fixed at 0.30')

e(2)
(year+i,k(i),'k--',year+i,kss(i),'g');
l('Time(t)'), ylabel('Capital Stock (RM million), k_t'),grid on
('Figure 6.3(d): Capital Stock versus Time(t) (30 years per
ation)')
d('Without Social Security','With Social Security')
('annualgwt (changing)')
('theta (changing)')

e(3)
(year+i,output(i+1),'k--',year+i,outputss(i+1),'g');
l('Time(t)'), ylabel('Productivity Output (RM million),
)'),grid on
('Figure 6.4(d): Productivity Output versus Time(t) (30 years per
ation)')
d('Without Social Security','With Social Security')
('annualgwt (changing)')
('theta (changing)')

e(4)
(year+i,s(i+1),'k--',year+i,sss(i+1),'g');
l('Time(t)'), ylabel('Savings (RM million), s_t'),grid on
('Figure 6.5(d): Savings versus Time(t) (30 years per generation)')
d('Without Social Security','With Social Security')
('annualgwt (changing)')
('theta (changing)')
```

```
figure(5)
plot (year+i,w(i+1),'k--',year+i,wss(i+1),'g');
xlabel('Time(t)'), ylabel('Wages (RM million), w_t'),grid on
title('Figure 6.6(d): Wages versus Time(t) (30 years per generation)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (changing)')

figure(6)
plot (year+i,r(i+1),'k--',year+i,rss(i+1),'g');
xlabel('Time(t)'), ylabel('Real Interest Rate, r_t'),grid on
title('Figure 6.7(d): Real Interest Rate versus Time(t) (30 years per
generation)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (changing)')

figure(7)
plot (year+i,cy(i+1),'k--',year+i,cyss(i+1),'g');
xlabel('Time(t)'), ylabel('Consumption of Young (RM million),
c_1_t'),grid on
title(' Figure 6.8(d): Consumption of Young versus Time(t) (30 years per
generation)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (changing)')

figure(8)
plot (year+i,co(i+1),'k--',year+i,coss(i+1),'g');
xlabel('Time(t)'), ylabel('Consumption of Old (RM million),
c_2_t_+_1'),grid on
title(' Figure 6.9(d): Consumption of Old versus Time(t) (30 years per
generation)')
legend('Without Social Security','With Social Security')
gtext('annualgwt (changing)')
gtext('theta (changing)')
```