

8. 経済被害の想定

8.1 経済被害の想定の流れ

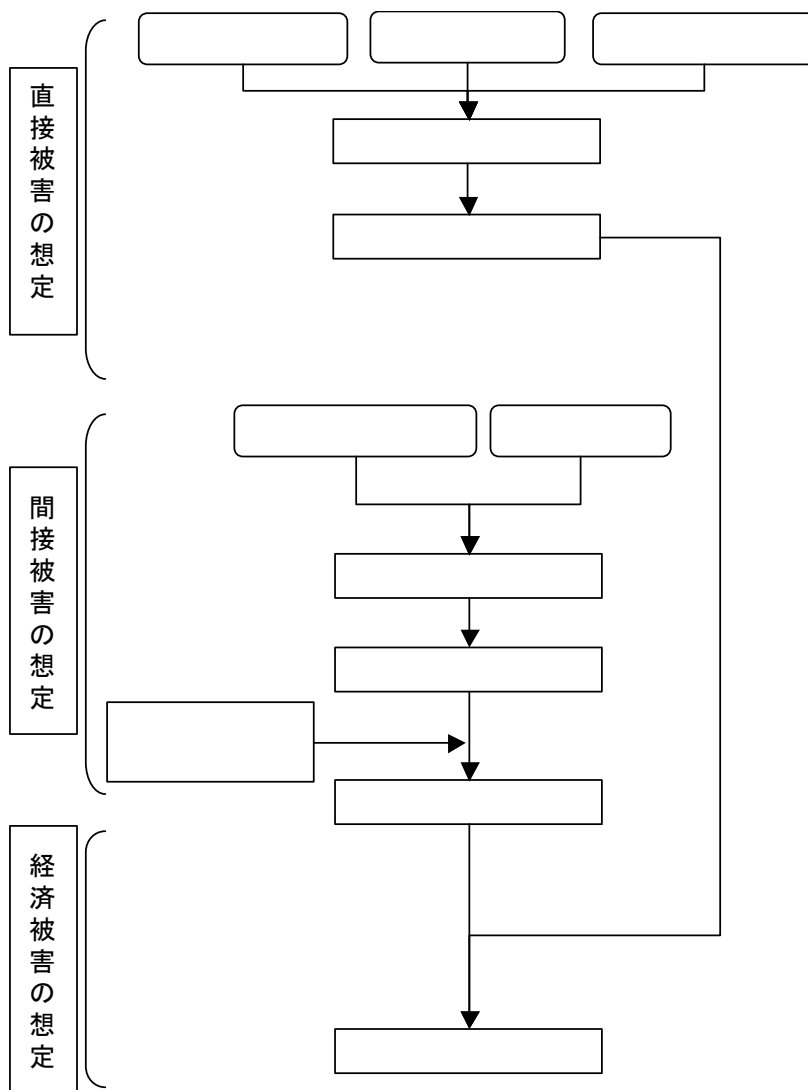


図 8.1-1 経済被害の想定の流れ

8.2 直接被害の想定

8.2.1 直接被害の想定手法

()

1)

$$\left[\begin{array}{ccc} & & \times \\ * & & () \quad 1/2 \end{array} \right]$$

2)

8 2-1

17

15 /

48 /

1, 834, 194 / 125, 256 ()

14.6 /

15 /

5, 806, 052 1, 067, 175 / 138, 038 4, 913 ()

48.1 /

48 /

第Ⅲ編 被害想定
8.経済被害の想定

表 8.2-1 火災保険 都道府県別物件別統計表（福岡県 平成 22 年度）

	195, 157	2, 748, 132
	124, 581	6, 696, 759
	4, 826	1, 406, 690
	522	525, 936
	325, 086	11, 377, 519

* 22

()

1) ()

×	() 1/2
---	---------

2)

80 *1

44 *2

()

18 3

1/2

15 /

*1 1, 413, 311 1, 136, 904 (80%)

*2 522, 800 232, 533 (44%)

()

1)

×	1
×	1

2)

(18)

8.2-2(1) 8.2-2(2)

()

24 2

表 8.2-2(1) 産業分類別事業所従業者 1 人当り償却資産評価額及び在庫資産評価額 (その 1)
(千人)

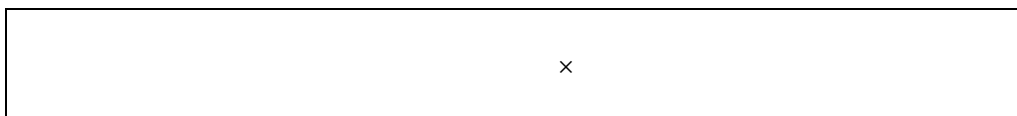
	23	23	
	12,563	4,392	942
	1,386	3,484	190,731
	4,344	4,671	261,086
	112,275	4,597	12,023
	5,574	977	57,536
	5,544	1,270	152,637
	1,922	2,159	527,437
	4,537	321	57,975
	23,352	11,149	60,201
	4,537	321	63,897
	1,837	159	221,761
	4,537	321	109,969
	1,108	249	122,403
	1,450	52	293,110
	4,537	321	12,703
	4,537	321	195,651
	4,537	321	73,312

()

24 2

第Ⅲ編 被害想定
8.経済被害の想定

1)



2)

(13)

(13)

(13)

(13)

12

23

a.

(kn)

b.

4

1

a. 12m m m
 b. () 100m
 c. 1,200㎡
 d. 15 /㎡ 18 /

40m
 40m
 120m 15m
 120x 15m 1,800㎡
 27 /

A=77% B=48% C=22%

93 /

7 23

() 1/5

表 8.2-3 公共土木施設の想定被害復旧単価一覧

	0.6	(/)
	0.6	(/
	2.9	/
	3.3	/
	0.4	/
	18.0	/
	27.0	/
	93.0	/
	1.5	/)

第Ⅲ編 被害想定
8.経済被害の想定

8.2.2 想定される経済被害（直接被害）

, ()

550,270 431,617 60,406 355,246 1,397,539 ()

表 8.2-4 直接被害算出総括表(建物、家財、公共土木施設の被害)

		23,951	14	/	407,071	550,270				
		10,251								
		1,621	63	/	143,199					
		1,304				431,617				
		19,267	15	/	342,732					
		8,246								
		721	88	/	88,885	6 /				
		580				355,246				
		164	0.6	/	98					
		144	0.6	/	86					
		1,947	2.9	/	5,646					
		517	3.3	/	1,706					
		33	0.4	/	13					
		152	18.0	/	2,736					
		263	27.0	/	7,101					
		3,534	93.0	/	328,648					
		0m	1.5	/m	0					
		30,703m	0.3	/m	9,211					
						1,337,133				

表 8.2-5 直接被害算出総括表(事業所償却、在庫資産の被害)

		942	0.43%	12,563	4,392	69	60,406			
		190,731	0.43%	1,386	3,484	4,038				
		261,086	0.43%	4,344	4,671	10,233				
		12,023	0.43%	112,275	4,597	6,109				
		57,536	0.43%	5,574	977	1,639				
		152,637	0.43%	5,544	1,270	4,522				
		527,437	0.43%	1,922	2,159	9,358				
		57,975	0.43%	4,537	321	1,225				
		60,201	0.43%	23,352	11,149	9,030				
		63,897	0.43%	4,537	321	1,350				
		221,761	0.43%	1,837	159	1,924				
		109,969	0.43%	4,537	321	2,323				
		122,403	0.43%	1,108	249	722				
		293,110	0.43%	1,450	52	1,914				
		12,703	0.43%	4,537	321	268				
		195,651	0.43%	4,537	321	4,132				
		73,312	0.43%	4,537	321	1,548				

8.3 間接被害の想定

8.3.1 間接被害の想定手法

*1

$$Y = AKL$$

GRP

$$Y = Y \quad Y = (AK \quad L) \quad (AK \quad L)$$

GRP(地域総生産額)

*1

17

18 1 23

1)

GRP

Fukuoka data web
8.3-1

第Ⅲ編 被害想定
8.経済被害の想定

表 8.3-1 県内総生産推移一覧

(単位 百万円)

年度	生産額	年度	生産額
1975	5,740,872	1994	17,355,743
1976	6,320,641	1995	17,260,363
1977	7,196,361	1996	18,247,902
1978	7,843,390	1997	18,381,016
1979	8,867,580	1998	18,141,491
1980	9,665,738	1999	17,820,424
1981	10,165,391	2000	17,983,005
1982	10,328,392	2001	17,517,143
1983	10,417,380	2002	17,503,214
1984	10,737,867	2003	17,687,927
1985	11,185,380	2004	17,863,365
1986	11,607,876	2005	18,154,894
1987	12,231,782	2006	18,294,810
1988	13,049,801	2007	18,566,149
1989	13,844,691	2008	17,901,107
1990	15,215,604	2009	17,564,936
1991	15,961,423		
1992	16,462,181		
1993	16,852,175		

2)

2000

1974

1997

2005

表 8.3-2 民間資本ストック推移一覧

(単位 百万円)

年度	民間資本ストック	年度	民間資本ストック
1974	11,575,462	1993	34,271,150
1975	12,853,229	1994	34,994,538
1976	14,064,411	1995	35,529,973
1977	15,167,228	1996	36,676,655
1978	16,327,951	1997	37,573,281
1979	17,551,499	1998	38,328,643
1980	18,609,187	1999	39,096,035
1981	19,637,290	2000	39,813,833
1982	20,624,901	2001	40,483,128
1983	21,565,489	2002	41,105,365
1984	22,584,254	2003	41,682,274
1985	23,552,360	2004	42,215,803
1986	24,536,475	2005	42,708,059
1987	25,837,452	2006	43,161,252
1988	27,225,127	2007	43,577,653
1989	28,980,212	2008	43,599,549
1990	30,695,960	2009	44,309,212
1991	32,163,143	2010	44,628,870
1992	33,517,108	2011	44,920,688

* 1974年～1997年値 「都道府県別に見た生産と民間資本及び社会資本の長期的推移」(石川達哉(2000))より抜粋
1998年～2011年値 1997年までの数値をもとに推定

3)

Fukuoka data

web

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8.3.3

表 8.3-3 労働力推移一覧

年	労働者数	労働時間 (一人月平均)	労働力	年	労働者数	労働時間 (一人月平均)	労働力
1974	1,742,400	178.6	3,734,312,415	1993	2,009,339	161.8	3,901,332,120
1975	1,775,630	175.4	3,737,346,024	1994	2,002,870	161.1	3,871,948,284
1976	1,791,355	178.7	3,841,382,353	1995	2,163,888	160.9	4,178,034,216
1977	1,807,220	178.2	3,864,559,058	1996	2,337,850	158.1	4,435,369,020
1978	1,823,225	178.3	3,900,972,210	1997	2,321,119	155.7	4,336,779,190
1979	1,870,927	180.4	4,050,182,214	1998	2,304,508	153.9	4,255,965,773
1980	1,919,877	180.3	4,153,844,851	1999	2,288,016	153.2	4,206,288,736
1981	1,970,107	180.6	4,269,615,890	2000	2,271,642	153.9	4,195,268,340
1982	1,935,937	181.9	4,225,762,992	2001	2,255,385	153.4	4,151,712,708
1983	1,902,359	183.5	4,188,995,377	2002	2,239,244	156.5	4,205,300,983
1984	1,869,364	183.7	4,120,826,644	2003	2,223,219	157.1	4,191,213,042
1985	1,836,941	176.3	3,886,233,374	2004	2,207,309	154.6	4,094,999,474
1986	1,805,081	174.4	3,777,673,517	2005	2,224,181	153.4	4,094,272,385
1987	1,846,580	174.2	3,860,091,009	2006	2,216,448	154.8	4,117,273,805
1988	1,889,033	180.2	4,084,845,477	2007	2,256,062	155.7	4,215,226,241
1989	1,932,462	178.2	4,132,377,593	2008	2,296,384	155.4	4,282,296,883
1990	1,976,890	175.5	4,163,330,341	2009	2,421,726	151.7	4,408,510,010
1991	2,022,339	172.5	4,186,241,730	2010	2,465,009	153.5	4,540,546,578
1992	2,015,828	169.5	4,100,194,957	2011	2,509,065	153.0	4,606,643,340

*「産業中分類別 男女別従業員数」ならびに「産業別常用労働者1人月間実労働時間数」他より(いずれもFukuoka data webより)

*2010年と2011年は、2009年までの数値をもとに推定

8.3.4

重回帰式	A	α	β
$Y = A K^\alpha \cdot L^\beta$	-6.7175	0.8722	0.3685
$\log(Y) = \log(A) + \alpha \log(K) + \beta \log(L)$	0.0012	0.8722	0.3685

回帰統計指標	
重相関 R	0.9870
重決定 R ²	0.9741
補正 R ²	0.9724
標準誤差	0.0524
観測数	33

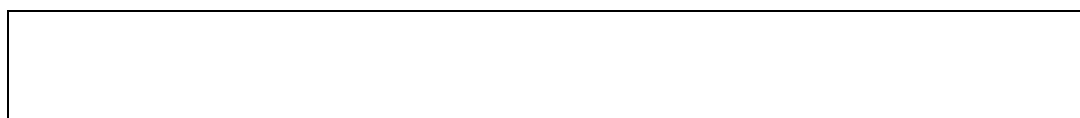
第Ⅲ編 被害想定
8.経済被害の想定

表 8.3-4 生産関数の係数の算出に用いた諸量

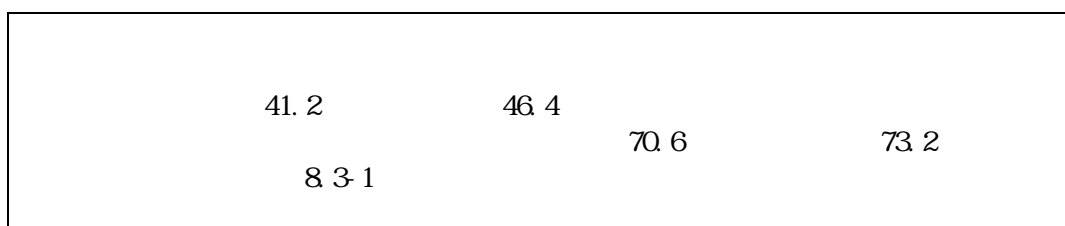
年次	Y		K 民間資本ストック (百万円)	L			
	地域総生産(百万円)			労働力			
	各年	3ヵ年移動平均		=従業者数 *労働時間	従業者数	労働時間 (年)	労働時間(月)
1974			11,575,462	3,734,312,415	1,742,400	2143.2	178.6
1975	5,740,872		12,853,229	3,737,346,024	1,775,630	2104.8	175.4
1976	6,320,641	6,419,291	14,064,411	3,841,382,353	1,791,355	2144.4	178.7
1977	7,196,361	7,120,131	15,167,228	3,864,559,058	1,807,220	2138.4	178.2
1978	7,843,390	7,969,110	16,327,951	3,900,972,210	1,823,225	2139.6	178.3
1979	8,867,580	8,792,236	17,551,499	4,050,182,214	1,870,927	2164.8	180.4
1980	9,665,738	9,566,236	18,609,187	4,153,844,851	1,919,877	2163.6	180.3
1981	10,165,391	10,053,174	19,637,290	4,269,615,890	1,970,107	2167.2	180.6
1982	10,328,392	10,303,721	20,624,901	4,225,762,992	1,935,937	2182.8	181.9
1983	10,417,380	10,494,546	21,565,489	4,188,995,377	1,902,359	2202.0	183.5
1984	10,737,867	10,780,209	22,584,254	4,120,826,644	1,869,364	2204.4	183.7
1985	11,185,380	11,177,041	23,552,360	3,886,233,374	1,836,941	2115.6	176.3
1986	11,607,876	11,675,013	24,536,475	3,777,673,517	1,805,081	2092.8	174.4
1987	12,231,782	12,296,486	25,837,452	3,860,091,009	1,846,580	2090.4	174.2
1988	13,049,801	13,042,091	27,225,127	4,084,845,477	1,889,033	2162.4	180.2
1989	13,844,691	14,036,699	28,980,212	4,132,377,593	1,932,462	2138.4	178.2
1990	15,215,604	15,007,239	30,695,960	4,163,330,341	1,976,890	2106.0	175.5
1991	15,961,423	15,879,736	32,163,143	4,186,241,730	2,022,339	2070.0	172.5
1992	16,462,181	16,425,260	33,517,108	4,100,194,957	2,015,828	2034.0	169.5
1993	16,852,175	16,890,033	34,271,150	3,901,332,120	2,009,339	1941.6	161.8
1994	17,355,743	17,156,094	34,994,538	3,871,948,284	2,002,870	1933.2	161.1
1995	17,260,363	17,621,336	35,529,973	4,178,034,216	2,163,888	1930.8	160.9
1996	18,247,902	17,963,094	36,676,655	4,435,369,020	2,337,850	1897.2	158.1
1997	18,381,016	18,256,803	37,573,281	4,336,779,190	2,321,119	1868.4	155.7
1998	18,141,491	18,114,310	38,328,643	4,255,965,773	2,304,508	1846.8	153.9
1999	17,820,424	17,981,640	39,096,035	4,206,288,736	2,288,016	1838.4	153.2
2000	17,983,005	17,773,524	39,813,833	4,195,268,340	2,271,642	1846.8	153.9
2001	17,517,143	17,667,787	40,483,128	4,151,712,708	2,255,385	1840.8	153.4
2002	17,503,214	17,569,428	41,105,365	4,205,300,983	2,239,244	1878.0	156.5
2003	17,687,927	17,684,835	41,682,274	4,191,213,042	2,223,219	1885.2	157.1
2004	17,863,365	17,902,062	42,215,803	4,094,999,474	2,207,309	1855.2	154.6
2005	18,154,894	18,104,356	42,708,059	4,094,272,385	2,224,181	1840.8	153.4
2006	18,294,810	18,338,618	43,161,252	4,117,273,805	2,216,448	1857.6	154.8
2007	18,566,149	18,254,022	43,577,653	4,215,226,241	2,256,062	1868.4	155.7
2008	17,901,107	18,010,731	43,599,549	4,282,296,883	2,296,384	1864.8	155.4
2009	17,564,936		44,309,212	4,408,510,010	2,421,726	1820.4	151.7

(=Ln(Y))	(=Ln(K))	(=Ln(L))
入力Y範囲	入力X範囲	
YY	X1	X2
	16.26439807	22.04082955
	16.36910562	22.04164158
15.67481829	16.45915812	22.06909813
15.77843664	16.53464761	22.07511343
15.89108342	16.60838898	22.08449164
15.98937962	16.68064992	22.12202771
16.07375041	16.73916594	22.14730021
16.12339893	16.79294087	22.1747897
16.14801565	16.84200969	22.16446567
16.16636628	16.88660486	22.15572678
16.19322251	16.9327635	22.13931962
16.22937232	16.97473659	22.08070624
16.27296145	17.01567134	22.05237419
16.32482412	17.06733563	22.0739566
16.38369248	17.11965089	22.13054974
16.45718579	17.18212381	22.14211877
16.52404326	17.23964161	22.14958115
16.58055439	17.28633173	22.15506921
16.61433093	17.32756655	22.13430036
16.64223424	17.34981445	22.0845839
16.65786398	17.37070255	22.07702365
16.684621	17.38588721	22.15310669
16.70382986	17.41765101	22.21287666
16.72004834	17.44180374	22.19039779
16.71221281	17.46170802	22.17158755
16.7048618	17.48153161	22.15984656
16.69322049	17.49972497	22.15722314
16.68725361	17.51639584	22.14678679
16.6816709	17.53164921	22.15961171
16.68821807	17.54558652	22.15625604
16.70042646	17.55830519	22.13303243
16.71166315	17.56989819	22.13285485
16.72451965	17.58045371	22.13845708
16.71989600	17.59005503	22.16196910
16.70647829	17.59055736	22.17755536
	17.60670316	22.20680260

1)



(7.2)
0.31

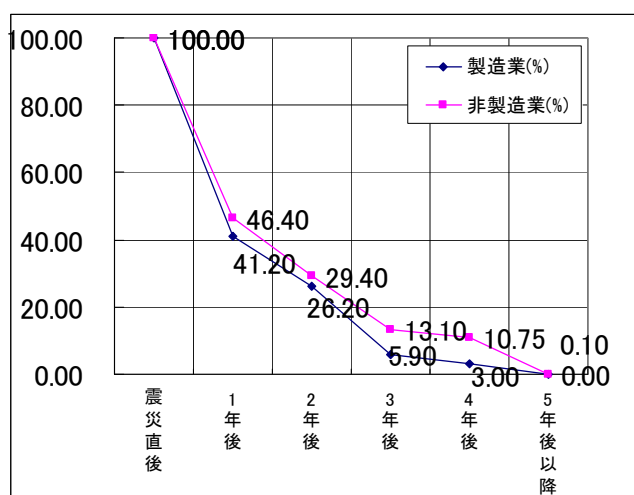


21

fukuoka data web

9,255(5.7)

158,473(94.3)
73.1



	製造業 (%)	非製造業 (%)	平均損失 (%)
製造・非製造 構成比率	5.7	94.3	—
震災直後	100.00	100.00	—
1年後	41.20	46.40	73.1
2年後	26.20	29.40	37.7
3年後	5.90	13.10	21.0
4年後	3.00	10.75	11.5
5年後以降	0.00	0.10	5.2
合計			148.4

図 8.3-1 被災建物の被害率の推移図

(「首都直下地震に係る被害想定手法について」内閣府(防災担当)作成資料を引用し、加工)

第Ⅲ編 被害想定
8.経済被害の想定

$$\begin{aligned} & \times 0.0031 \times 1.484 \\ & \times 0.0046 \end{aligned}$$

2)

3.6

3.6

$$\times 0.036$$

8.3.2 想定される経済被害（間接被害）

2011

86,229

2011	20,812,927 ()
2011	20,690,126 ()
	122,801 ()

8.4 経済被害の想定結果

(7.2)

1 5,200

		()
1	3,975	1,228
1	5,200	

1

1 5,200

GRP

2/3

20

18

77

区分	合計	昭和 57 以降建物	昭和 56 以前建物			現状の耐震化率 〔平成 20 年〕 (%)
			小計	耐震性あり	耐震性なし	
持ち家総数	1,090,400	671,600	403,000	19,300	383,800	64.8%

20

27

90

90

¹ 1990

第Ⅲ編 被害想定
8.経済被害の想定

		119,581	129,262	86,975	78,603	225,036	263,949	130,109	270,900	318,122	380,485	407,071	296,954	
		58,811	63,032	30,839	25,988	87,161	90,689	85,901	174,384	173,534	136,427	143,199	106,092	
		100,681	108,832	73,228	66,180	189,468	222,231	109,545	228,083	267,842	320,348	342,732	250,019	
		36,504	39,124	19,142	16,131	54,101	56,291	53,319	108,241	107,714	84,681	88,885	65,852	
		24,808	26,589	13,009	10,962	36,767	38,256	36,236	73,561	73,203	57,549	60,406	44,753	
		26	32	19	24	67	60	49	86	85	107	98	59	
		20	25	15	26	63	53	53	92	84	90	86	53	
		2,114	3,129	2,587	5,841	10,982	8,274	5,562	9,767	8,680	6,748	5,646	2,163	
		1,016	1,092	304	545	1,175	660	1,812	3,214	2,145	1,597	1,706	749	
		49	49	13	4	19	9	52	94	64	22	13	0	
		864	1,278	1,404	1,782	2,988	3,168	1,818	2,718	2,790	2,556	2,736	2,142	
		2,862	4,401	3,942	4,590	10,206	9,855	5,535	9,207	9,342	7,128	7,101	4,725	
		294,874	306,482	310,990	326,011	348,303	346,966	323,729	342,314	338,760	321,402	328,648	317,625	
	(83,378	83,678	83,378	87,178	87,178	112,703	29,325	29,325	29,325	0	0	0	
	(2,486	3,145	2,206	9,073	11,876	4,982	10,228	11,162	12,827	12,507	9,211	432	
		42,157	47,078	24,609	24,706	72,428	74,013	62,813	125,872	126,447	117,934	122,801	85,213	
		770,232	817,228	652,660	657,642	1,137,819	1,232,188	856,067	1,389,022	1,470,961	1,449,582	1,520,341	1,176,833	

37,127

9.8

2

	34,202	4,071
	2,925	1,432
	37,127	5,503

	27,517	3,427
	1,301	889
	28,814	4,316

37,127

10

90

18

10 20

200

200 × 33,414 668

9,819 × 90 8,837

8,837 668 8,169

8.3-5

表 8.3-5 「経済被害軽減額の試算と減災効果」

	9,819	200 × 33,414 668	8,837 668	8,169

8,200