

# Economic crises and the risk of disability

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## 1 Background

A global financial crisis has been affecting the whole world since the 3rd quarter of 2008. World trade is dropping, industrial production is collapsing, companies' production capacity utilisation is at historic lows, unemployment is increasing and is likely to surge (1). Global time series on industrial output, stock data and trade volume illustrate that the world economy is plummeting in a similar way as during the first nine months after the peak of the Great Depression of 1929 (2).

Against the background of this threatening economic reality it is no wonder that the consequences for disability insurance are being discussed globally in the insurance industry. Obviously we are concerned about a likely increase in disability claims. This paper aims at providing a deeper understanding of the relationship between an economic crisis and disability risks.

How is the economic situation related to disability claims? From a general point of view the following impacts of an economic crisis are of relevance:

- a. New objective disability  
Illnesses may be caused by more hazardous or more stressful working conditions, e.g. occupational accidents (3) or mental disorders.
- b. "Latent" objective disability  
People already suffering from a disability who have not claimed because they were in a favourable employment are likely to claim in case of redundancy.
- c. New subjective disability  
Economic pressures are likely to lead to more fraudulent behaviour, especially within an environment of liberal claims assessment.
- d. Remaining subjective disability  
Disabled people will have less incentive to recover.

As the disability insurance products vary widely between countries, the significance of these impacts is manifold. A very important risk factor is the comprehensiveness of the disability definition as the inclusion of temporary or partial disability gives the individual a wide range of choices:

- A partially disabled person with severe back pain can choose between continuation of employment and claiming for disability benefits whilst a totally disabled person has no choice.
- In case of temporary total disability (= sick leave) the assessment of the ability to work is often rather subjective.

In the next chapters we discuss on what can be learnt from history.

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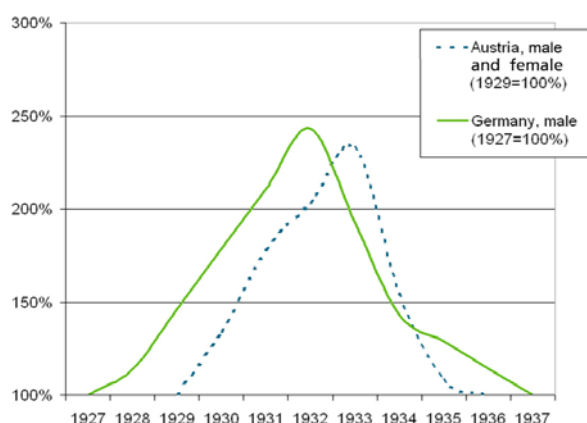
## 2 Lessons from the Great Depression?

The Great Depression of 1929 was the most severe economic crisis of the 20th century. The impacts on unemployment and disability were extraordinary. For example, the number of Germans unemployed increased within a few years from about 1 to 5 million.

A basic paper on the effects of economic conditions on disability insurance was published in 1972 (4). German, Austrian and U.S. invalidity data during the Great Depression were analyzed and the scope of a typical wave (see next figure) was found for German and Austrian social disability schemes.

For German male and Austrian male and female aggregated social security scheme data a peak of about 240% of invalidity rates was observed in comparison to the years before the economic crisis. A similar magnitude was noted in U.S. private disability insurance. For several age bands and tariffs the U.S. invalidity rates in the period 1930-1935 were about twice as high as in the period 1946-1950.

**Figure 1: Change of Austrian and German disability prevalence during the Great Depression**



Source: Based on (4).

Note: Six data points for Germany, no data for 1933.

Such a wave of additional disability claims would cause an increase in the net present value of claims of about 31% in our sample portfolio (average age 38 years). This amount is similar to the disability stress scenario assumptions for European solvency requirements at QIS4 stage (5).

A comparison of the smoothed annual changes in

disability rates with the smoothed annual changes in unemployment rates in Germany (6) shows that the delta for the disability rates was mostly between 40% and 70% of the unemployment rate changes.

However, the applicability of this past experience in today's private disability insurance market is debatable:

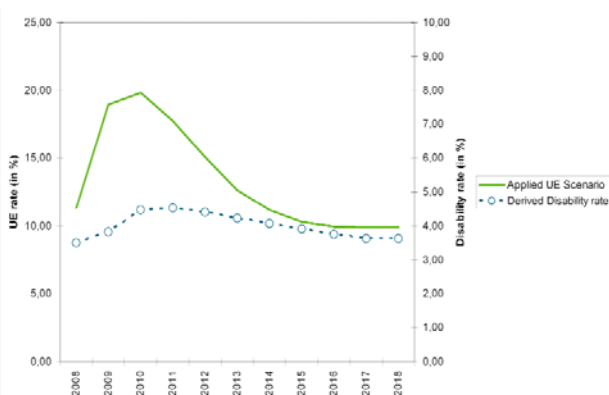
- For the U.S. private insurance experience, the transferability is limited as risks selection and claims assessment were rather lenient. In consequence of the distorted claims activity during the Great Depression the insurance industry significantly tightened these conditions.
- For the experience in the social security schemes we have to consider that the political environment may have encouraged a lax attitude regarding disability claims. However, when economic conditions worsen one may expect even today that significant consumer pressure will be applied to insurance companies, forcing them to handle disability claims in a less restrictive manner.
- Another crucial point is that the alternative social security benefits (i.e. sickness and unemployment benefits) were not as generous as today. Moreover, during the crisis of 1929 the unemployment benefit amounts and benefit duration were repeatedly decreased (7). Obviously, the incentive of claiming for disability benefits would have been lower if the unemployment benefits had been more favourable.
- The economic conditions in the years before the recession had been very favourable. The German unemployment rate decreased significantly before 1927, so that many disabled people became employed or remained in a favourable employment. It has been pointed out that this "latent" disability "pool" can be a main driving force for strong increasing disability claims in a recession (4).
- On the other hand we have to consider that non-objective causes for disability (mental disorders and back-pain), which are more difficult to verify, have developed to become one of the most important causes for disability claims today.

What can we learn? At first, from our point of view the experience of 1929 may provide an indication

of a more or less abstract catastrophic scenario. Especially in Western European countries with their comprehensive social security schemes, we expect a significantly dampened amplitude and a lengthened duration of the wave due to temporarily relatively high unemployment benefits.

For illustration purposes we applied arbitrarily 75% of the average unemployment (UE) elasticity derived by smoothed German disability and unemployment data (see above) on an actual UE rate forecast for Spain (8), which is one of the labour markets most seriously affected by the recent economic crisis. Furthermore, we assumed a time lag of one year; i.e. the change of disability rate in year  $t$  is based on the unemployment change of year  $t-1$ .

**Figure 2: Disability forecast scenario for Spain (assumed UE elasticity = 0.38)**



Source: Based on (8, 9).

Under these very simplified scenario assumptions we would expect for our sample portfolio about 15% additional claims (net present value).

Moving onto best estimate pricing, the applicability seems to be rather limited. We draw the general conclusion that a precise, objective disability definition as well as a strict and enforceable claims assessment is seen as a pre-requisite for sustainable disability pricing. The importance of understanding the framework set by the whole social security system, from unemployment insurance through to disability pensions, is obvious. Moreover, the incalculable risk of blindly following the social security scheme's claims assessment has been underlined.

### 3 Lessons from more recent economic cycles?

In this section we summarize a few additional insights based on a number of more recent studies on the impact of economic cycles on the disability risk. However, one has to consider that our post-war economic downturns were much less challenging for disability insurance than the Great Depression.

At first, we have to recognize that some authors discuss an adverse relation between economic conditions and disability. In contradiction to the pro-cyclical increase of disability claims during the Great Depression, for example, the negative correlation of increasing unemployment rates and temporary total disability (sick leave) was discussed, for example, in France (10) and Germany (11).

#### 3.1 Adverse behaviour of temporary total disability claims

Surveys have shown that under economically stressed conditions a lot of employees avoid sick leave because they are afraid of losing their job. For example, a German representative survey (12) says that 30% worked in the year before despite the doctor's recommendation to stay at home and 21% took holiday for recovery. Moreover, this situation seems to remain for a certain period of time while the unemployment (UE) rates have started to decrease again (11).

We now briefly analyse the relation between annual Temporary Total Disability (TTD) data from the public health funds in Germany (13, 14) and German UE rates between 1970 and 2007. The great advantage of this data is the long time series containing four of the five recessions in the post-war history of Germany. The next figure shows the development of TTD (in % of missed days p.a.) and UE (in % of the civilian dependent labour force). Both variables are highly correlated with the linear trend. Consequently, the correlation for TTD and UE is high, exactly -0.77.

**Figure 3: Observed TTD and UE in Germany**

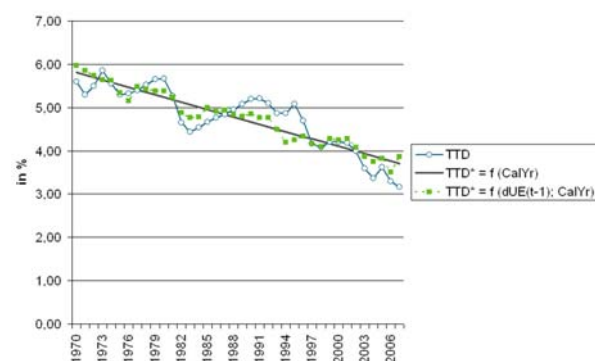


Source: Based on (13, 15).

The reasons for the long-term decreasing TTD rate were a shrinking share of blue collar, less extra-hazardous job activities, an increasing share of younger employees (esp. baby boomers), improving prevention measures by employers and better medical care.

The mid-term shape of the TTD and UE curves seems to be cyclical. Most interesting is that the deviations from the linear long-term trend seem to be in opposite directions. This indicates a significant additional explanation of the TTD development by the UE rate. The next figure shows the observed TTD data, the linear trend estimation by calendar years and the multiple regressions with trend and UE rate as explanatory variables.

**Figure 4: TTD and estimates of time-series determinants**



Source: Based on (13).

Obviously, the up and downturns of TTD can partially be explained by the UE variable. Exceptions are

the first and the last years of the observation period and, more significantly, the economic crisis in the mid-nineties. A possible explanation for the deviations in the nineties might be the relatively long period of increasing unemployment after the recession in 1993 which was caused by significant, lasting cost saving measures in the industry. In this case increasing mid-term TTD may have over-compensated the reduced short-term TTD claims.

For identifying a partial explanation by the UE variable in addition to the trend variable, it is necessary to take into account a one year time lag. A possible rationale is given by the above quoted survey results (11) which say that the decline in TTD seems to remain while the UE rates have started to decrease again.

Although the choice of a linear model has its limit, the result of the regression legitimates the question of TTD being anti-cyclical and negatively correlated with UE. However, we have to keep in mind that mainly less severe and temporary impairments allow to staying at work under economic pressure. Hence, we expect a limited impact when the deferment period exceeds a few weeks or the definition is explicitly requiring "permanent" disability.

### 3.2 Pro-cyclical development of long-term disability claims

In contradiction to the adverse, anti-cyclical development of TTD claims, a substantial body of empirical research addresses the pro-cyclical behaviour of long-term disability prevalence.

#### 3.2.1 Main economic determinants are consumer confidence and unemployment

From a wide range of economic variables, the main explanation of the variation in long-term disability claims (incidences and/or duration) was contributed by

1. Consumer confidence indices,
2. Unemployment (for employees) and bankruptcies (for self-employed),
3. Gross domestic product and retail sales.

The significance of these main determinants varies widely by the particular study and the explained variable (incidence, claim duration or claim costs). Based on our research on international analyses we generally agree with the conclusion (16) that “the general proposition of the dependence of disability experience on economic conditions is supported” by empirical data, whilst “the extent of the correlation and the detailed process which leads from economic conditions to disability claims are not, as yet, well understood”.

Particularly in the United Kingdom, no clear empirical evidence for the correlation of economic cycles and the disability risk was found by investigations (17) on the impact of various economic variables on claim inception of Permanent Health Insurance (PHI) data for eight years (1987 to 1994). Other authors discussed whether the short observation period and the partly over four-year period averaged data was inappropriate (16). On an extended time series (1975 to 1994) another more recent investigation (18) found that “the cyclical appearance of [the log-claim inception intensities] leads to the suggestion of an association with indices of the economic cycle, and a possible causal link”.

From the United States we experienced a further distortion of economic cycles. It was discussed (19) that individual disability insurance in the U.S. has shown market cycles due to the insurers’ behaviour. The main argument is that companies typically overreacted during both the good times and the bad times. So, the industry reduced tariffs, weakened conditions, applied less tight medical underwriting and claims management and extended the benefits in favourable economic environment and vice versa. In conclusion, time series data on disability claims can be significantly impacted by such mid-term “market cycles”.

Currently, a further risk factor that may dampen the expected increase of disability claims is under discussion within the U.S. Group insurance industry. Due to the very high burden of house and consumer debts a lot of households seem to be under tremendous financial pressure. In contradiction to the past decades one may assume that “latent” disabled insured cannot afford to becoming disabled anymore. Disability benefits limited to 60-70% of the salary (group long-term disability) may not provide a sufficient alternative.

3.2.2 Limitation of new subjective claims by appropriate claims assessment

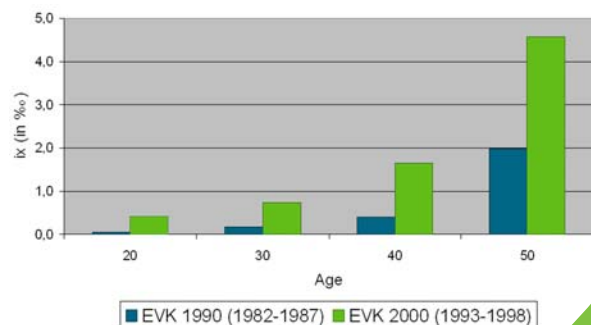
For U.S. group long-term disability (1995 to 2001) there was a significantly stronger correlation of economic variables with submitted claims than with paid claims (20). Furthermore, submitted claims incidences by cause of disability generally correlated more strongly than submitted incidence levels do overall. The authors found that disability due to back pain, mental disorders, general sickness, arthritis/respiratory disorders and cancer was positively correlated with economic downturns.

This result supports our understanding that economically stressed situations may lead to more objective claims (i.e. due to stress) and new subjective claims (i.e. by fraud). The less strong correlation with paid claims may indicate that a non-minor part of unjustified claims submissions can be repelled by an appropriately tight claims assessment (cf. discussion of the lessons from 1929).

3.2.3 Latent disability, liberal labour market, and claim definition

For Switzerland, several statistics on the public disability schemes and private disability insurance show a very strong correlation between economic downturns and disability claims. For example, a comparison was made between the disability annuity inceptions provided by the Swiss collective annuity insurance fund (EVK) in 1990 and 2000; the so-called EVK 90 and EVK 2000 tables.

**Figure 5: Increase of Swiss disability incidences from 1982-87 to 1993-1998 (male)**



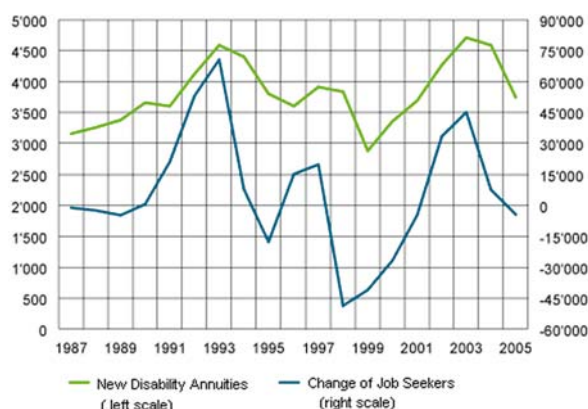
Source: (21)

It was assumed that this difference is mainly caused by different economic conditions during the observation periods: strong growing economy in the eighties and stagnation in the nineties (21, 22).

Furthermore, the disability annuity inceptions of individual insurance data showed a strong increase of about 100% in the decade 1981-85 to 1991-95. This was mainly explained by the worsening economic conditions in the same period of time (23). During the following improving economic conditions, the incidences from individual disability insurance data decreased again significantly.

Long-term statistics for disability claims are available from a fourth source, the obligatory personal accident insurance scheme (24). This data is less sensitive to new subjective claims as it is limited to disability claims due to accidental causes (i.e. no claims due to mental disorders, general sickness or psychosomatic problems). The following figure illustrates the strong positive correlation of new disability claims (green line) and absolute change of number of job seekers (blue line).

**Figure 6: Disability incidences and number of job seekers in Switzerland**



Source: (24)

Based on this data it was discussed (25) that the economic worsening conditions in 1996 had not such a significant impact as the recession in 1993. The authors assume that the increase of disability claims in 1993 was mainly caused by "latent" invalidity, so that during the prosperous period before 1993 a lot of "objectively" invalid persons continued working and did not claimed. In the following economic downturn of 1996 the amount of "latent" disability was still

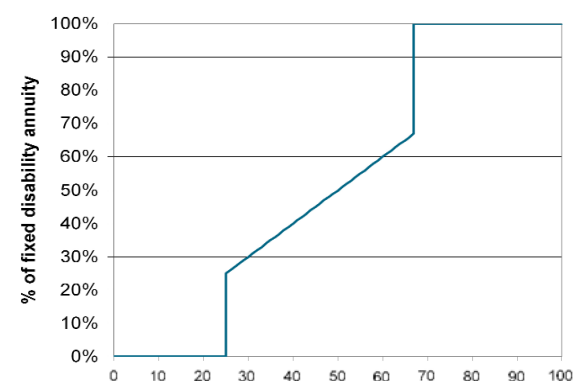
low; consequently the increase of claim costs was not as high as in 1993.

The more recent economic downturn in 2002/03 caused an outstanding increase of new disability claims and could support the hypothesis of "latent" disability as well. The reduced number of new disability claims in the economically favourable years from 1998 to 2001 may indicate an increasing number of "latent" disabled lives which claimed for disability annuities in the following recession.

As pre-requisite for the observed extraordinarily strong correlation between economic development and disability claims due to "latent" disability, we have to consider the following two issues:

- The very flexible labour market conditions in Switzerland where disabled persons can easily be made redundant (26).
- The Swiss definition of disability contains partial disability. This is rather sensitive to economically impact as it provides partial disability benefits beginning from a rather low threshold of 25% invalidity (see Fig. 7). Hence, "latent" disability can develop more easily as less severe invalidity may allow the continuation of work (maybe part-time).

**Figure 7: Partial disability benefits in Swiss insurance**



Source: Illustration based on a theoretical example.

In addition the disability definition is related to the "own or similar occupation" concept which is obviously more sensitive than the any occupation definition. For example, a roofer with knee problems may not be

able to work more than 5 hours per day in his own occupation, but he would be able to work full-time as a receptionist at a desk. In this case the any occupation definition would not cover a claim.

Consequently, the applicability of the significant Swiss results to other markets and products highly depends on the comparability of labour market conditions and (partial) disability definition.

#### 3.2.4 Industry specific impacts of economic downturns

Obviously, economic crises can have different impacts by industry class and occupation. On the one hand, the recessions can originate from specific industries and remain with limited consequences for other sectors of the economy. For example, the burst of the "new economy bubble" in 2000 had a strong impact on the IT profession but limited effect on other occupations. Another example by Swiss experience (25) shows that the increase of claim costs in the mid-mineties was significantly above average for the construction sector (total claims costs +65%; incidences +40%) and remained nearly unchanged for the public sector.

On the other hand an industry-wide recession such as the current crisis is clearly striking the whole economy with widely varying intensity (e.g. housing construction) and response time (e.g. immediate consequences on the bank sector and delayed effect on the "real" production). For example, in the United States (27) the wholesale-retail trade sectors tend to experience the recession up to nine months before the rest of the economy. Therefore, similar differences could be expected for disability incidences as well.

In general, a significant share of civil servants reduces the economical risk in a disability insurance portfolio as the public sectors are usually less exposed to unemployment risk. We have not found an empirical basis for differentiations by white and blue collar or other industry classes.

#### 3.2.5 Statutory disability insurance and political risk

Finally, we want to point out the political risk involved in following the statutory disability schemes. An often quoted case is the Dutch disability insurance disaster which was not limited to the social security scheme but had consequences on the private insurance mar-

ket as well. Particularly the Group disability market was affected as the employer disability insurance plans are legally obliged to follow the claims assessment decision of the social security scheme.

This became a serious issue as the Netherlands had a disastrous policy on disability benefits especially in the eighties; the main reasons were (28):

- very low thresholds of 15% for partial disability benefits,
- generous disability benefits used to be 80% of the loss of earnings, which were raised up to 100% by the Ministry of Social Affairs due to collective bargaining, and
- the claims assessment was based on the decision of an indulgent administration regarding the loss of earnings due to disability (wage-related concept) instead of an objective forecast of disability (medical concept). It is no wonder that the two most prevalent causes of disability were psychiatric and back pain problems which are more open for manipulation ("subjective" claims).

Consequently, "workers prefer the higher and longer-lasting disability benefit to the unemployment benefit and firms find it an easy and cheap workforce management tool to get rid of less productive and older workers" (28). Under these circumstances, the legal obligation of following the claims assessment of the social security scheme became an expensive experience for private group insurance in the eighties.

## 4 Conclusions

We finally conclude that the disability risk is clearly related to economic conditions. With a certain time lag the disability claims are behaving pro-cyclically. Increasing unemployment and bankruptcies as well as deteriorating consumer confidence have been found by many empirical studies as appropriate determinants for rising disability claims and vice versa. In our understanding the impact of an economic downturn on rising disability claims depends mainly on the probability of new objective claims due to "latent" disability and the possibility of having new subjective claims due to less strict claims

assessment. In addition, we have some reasons to assume that especially for temporary disability and in case of a lenient reassessment of the recovery rates for disability will decrease during an economic crisis.

The relevance of the important “latent” disability depends mainly on the following topics:

- The consideration of partial disability by low invalidity thresholds (e.g. 25%) increases the number of disabled employees in work (i.e. the number of “latent” disabled).
- The definition of occupation as the possibility to remain in work in case of being (partially) disabled for the own occupation is higher than for any occupations.
- Fixed annuity amounts are exposed to the economic risk as the disability annuity may even exceed the loss of income in case of decreasing salaries (either by direct salary cut or by part-time work). This risk can be mitigated by annuities limited to the loss of income (e.g. 50-80% replacement ratio).
- The labour market conditions with regard to “competitiveness” of unemployment benefits and the restrictions of laying off disabled persons.
- The length and strength of favourable economic conditions before the downturn. The impact of a recession after a longer period of economically favourable conditions is expected to be significantly higher than shortly after a previous crisis. We draw the general conclusion that a precise, objective disability definition as well as a strict and enforceable claims assessment is seen as a pre-requisite for sustainable disability pricing. The importance of understanding the framework set by the whole social security scheme, from unemployment insurance to disability pensions, is obvious.

From our point of view the analyzed publications support the need to take into account the underlying economic conditions for pricing. Disability claims experience from the peak or the bottom of an economic cycle can not be used for the pricing of long-term business without considering probable distortions.

Furthermore, one may assume that increasing lapses during an economic downturn have an anti-selective impact. In general, this issue should be worth in the presence of significant subjective and “latent” disability.

For a sample of private markets we assume the following range of vulnerability to an economic crisis:

1. The income protection market in the United Kingdom is not very exposed to the economic risk as the disability claims are limited by a very strict definition for “total” disability; the claimant has to be unable to fulfil the working activities by 100%.
2. The German professional disability is limited to total disability (threshold 50%). The fixed annuity amounts are usually kept significantly below the probable loss of income by strict financial underwriting (e.g. replacement ratio of 75%). In conjunction with the favourable (temporary) statutory unemployment benefits and the high level of protection for disabled employees one may expect a moderate exposure for the German market.
3. In our opinion the disability market in the Netherlands is clearly exposed to economic downturns. The coverage of “partial” disability with a rather low threshold of 25% disability is our main concern. On the other hand the limited replacement ratio, intensive and strict claims (re)assessment procedures and a participation of the employers on group disability benefits are risk mitigating strengths; the lessons from the eighties have been learnt.
4. Clearly confirmed by the claims experience the disability market in Switzerland is very highly exposed to economic downturns. Again, the coverage of “partial” disability at a threshold of 25% is critical. We discussed the extraordinary sensitivity on economic cycles due to the very liberal labour market conditions in Switzerland. However, in private Swiss individual covers the risk is mitigated by long deferment periods of 12 or 24 months and (in most cases) annually reviewable rates.

The wide variety of social security schemes and private disability insurance products require case specific analyses on the risk of economic downturns. The presented discussion of main determinants and exemplary markets should provide an overview on the crucial issues to be considered.

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