

ECONOMIC MODELLING OF THE COST OF PRESENTEEISM IN AUSTRALIA

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CANBERRA HEAD OFFICE

Econtech
P.O. Box 4129
Kingston ACT 2604
Phone: (02) 6295-0527
Fax: (02) 6295-8513
E-mail:office@econtech.com.au

SYDNEY OFFICE

Econtech
Suite 304, 66 Berry Street
North Sydney NSW 2060
Phone: (02) 9929-4700
Fax: (02) 9929-4793
E-mail: sydney@econtech.com.au

Web-site: www.econtech.com.au



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Key Findings

- This study considers the presenteeism resulting from 12 different medical conditions (allergies, arthritis, asthma, cancer, depression, diabetes, heart disease, hypertension, migraine/headache, respiratory disorders, skin conditions and back, neck or spinal problems).
- The overall average labour productivity loss caused by presenteeism is estimated to be about 2.5 per cent.
- The direct costs of presenteeism to Australian employers are estimated to be around 1.9 per cent of GDP (equivalent to about \$17.6 billion of real GDP in 2005/06, 2004-05 prices).
- The direct costs of presenteeism filter through the economy, causing changes to capital investment and other impacts to upstream and downstream industries. These other impacts are called the indirect impacts of presenteeism. Econtech used its MM2 model of the Australian economy to fully capture the direct and indirect effects presenteeism.
- On average, the labour productivity losses caused by presenteeism lead to a long-term decrease in GDP of 2.79 per cent. On an annual basis, this is equivalent to about \$25.7 billion of real GDP in 2005/06 (2004-05 prices).
- Presenteeism causes private consumption to be 3.3 per cent lower than if presenteeism did not exist. This means that private consumption in 2005-06 was \$17.8 billion lower due to labour productivity losses caused by presenteeism (2004-05 prices).
- The negative impact of labour productivity losses stemming from presenteeism flow throughout the economy, leading to a general reduction in the level of exports, imports and investment (*all other things being equal*).
- Exports are lower by 2.8 per cent (equivalent to about \$4.8 billion of exports in 2005/06, 2004-05 prices) and imports are lower by 1.99 per cent (equivalent to about \$4.06 billion of imports in 2005/06, 2004-05 prices).
- Investment is 2.61 per cent lower. This means that investment in 2005-06 was \$3.7 billion lower due to presenteeism (2004-05 prices).
- The results presented in this report demonstrate that presenteeism has substantial impacts on productivity and imposes an important economic burden to businesses and to the Australian economy as a whole.
- The evidence presented in this report indicates that investments in interventions that improve functioning for individuals with health conditions would have considerable impacts in terms of productivity improvements and on macroeconomic aggregates.

Executive Summary

Introduction

Presenteeism is defined as the lost productivity that occurs when employees come to work but, as a consequence of illness or other medical conditions, are not fully functioning. Previous research undertaken in the United States shows that presenteeism can decrease individual productivity by one-third or more.

It is clear that presenteeism represents a problem for employers and a clear cost to a country's economy. This is why, in recent years, Medibank Private has been working to increase awareness of the benefits of workplaces that foster a healthy environment for employees.

To further its advocacy platform in the area of workplace health, Medibank Private commissioned Econtech to estimate the cost to the Australian economy of productivity losses due to presenteeism in the workplace.

Advantages over Previous Work

To our knowledge, this Econtech study is the first attempt to estimate the costs of presenteeism on the Australian economy. Econtech's approach to estimate the costs of presenteeism on the economy in terms of GDP included, additionally to the direct effects of presenteeism, indirect effects of presenteeism. This has not been done in national or international studies on the effects of presenteeism and allows assessing the effects of presenteeism on the national and industry level more comprehensively. Particularly, the estimated effects of presenteeism provided in this study include the following three components:

- the direct costs faced by employers due to the on-the-job productivity losses caused by presenteeism;
- the indirect costs to the Australian economy due to adjustments of complementary input factors to lower labour productivity levels caused by presenteeism; and
- the indirect costs to the Australian economy arising from changes in terms of capital intensity^{1,2} and other second round effects.

Modelling Approach

The economic cost of presenteeism to the Australian economy was estimated using Econtech's MM2 model. MM2 is a fully integrated macro-industry econometric model which can be used to fully capture both the direct and indirect impacts of presenteeism to the Australian economy over time.

This study considers the presenteeism resulting from 12 different medical conditions. These are allergies, arthritis, asthma, cancer, depression, diabetes, heart disease, hypertension,

¹ Capital intensity is the term in economics for the amount of capital present in relation to other factors of production, especially labour (i.e. the amount of capital per unit of labour input).

² This effect arises from a modelling assumption that causes government consumption to be less responsive to changes of labour efficiency. As a result we observe a reduction of capital intensity of the whole economy with adverse effects on GDP.

migraine/headache, respiratory disorders, skin conditions and back, neck or spinal problems. Econtech estimates the loss in aggregate labour productivity resulting for each medical condition. For each medical condition, this involves applying Australian data on the prevalence of the disease in people of working age to international estimates of the on-the-job productivity losses from the disease and an adjustment factor reflecting the frequency of a presenteeism effect from the disease.

Econtech estimated the overall average labour productivity loss caused by presenteeism to be about 2.5 per cent. This estimate reflects the labour productivity losses caused by the main medical conditions mentioned above. This figure was introduced into MM2 to estimate the economy-wide impacts of presenteeism in Australia.

Results

This Econtech study estimated two kinds of presenteeism costs, the costs of presenteeism to the employer (direct costs) and the costs of presenteeism to the economy (which include the direct and indirect costs).

The direct costs of presenteeism to the employer are the value of lost labour input. These costs interpret productivity in terms of labour productivity and value it in terms of wages.

The effects of presenteeism to the whole economy use a multi-factor productivity approach. This approach allows for adjustments of the complementary input factors (capital stock in the economy) to lower labour productivity levels. These adjustments, which are called indirect effects, add to the direct effects of lower labour productivity levels and result in an overall percentage loss of GDP which approximately equals the percentage loss of labour productivity.³

The direct costs of presenteeism to Australian employers are estimated to be around 1.9 per cent of GDP (equivalent to about \$17.6 billion of real GDP in 2005/06, 2004-05 prices). This is estimated by multiplying the overall labour productivity loss due to presenteeism estimated by Econtech (2.5 per cent) times the labour share of the economy (0.75). In comparison, international studies⁴ found the direct costs of presenteeism in the US to be approximately 1.7 per cent and 2.5 per cent of US GDP.

These direct costs then filter through the economy, causing changes to capital investment and other impacts to upstream and downstream industries. These other impacts are called the indirect impacts of presenteeism.

To fully capture the direct and indirect effects presenteeism, Econtech has used its MM2 model of the Australian economy. MM2 is a fully integrated macro-industry econometric model which can be used to fully capture both the direct and indirect impacts of presenteeism on the Australian economy. The direct costs of presenteeism, i.e. the labour productivity losses are estimated to account for 68 per cent of the total costs of presenteeism. The indirect costs of presenteeism are estimated to account for the remaining 32 per cent of the total loss.

³ In our model the overall effect slightly exceeds the percentage loss of GDP which is owed to the modelling assumptions mentioned in footnote 1.

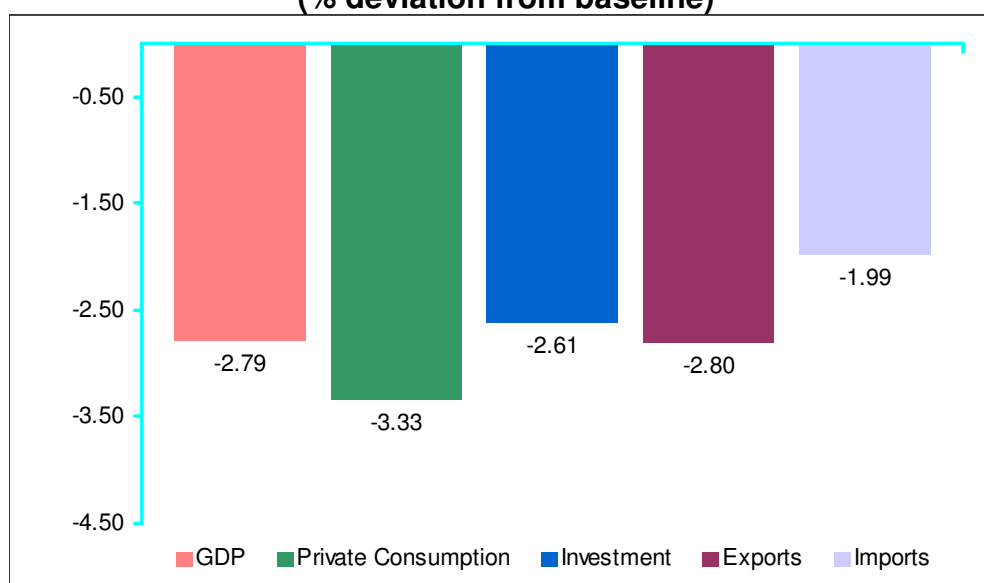
⁴ Gotzel, et al. (2004) and Stewart et al. (2003a)

Chart A shows the national macro-economic effects of presenteeism. Specifically, the chart shows that on average, the labour productivity losses caused by presenteeism lead to a long-term decrease in GDP of 2.79 per cent. On an annual basis, this is equivalent to about \$25.7 billion of real GDP in 2005/06 (2004-05 prices).

Furthermore, Chart A shows the effects of presenteeism on private consumption. The chart shows that private consumption is 3.3 per cent lower under the Baseline Scenario⁵ (where presenteeism continues to exist as its current rate) than under the No Presenteeism Scenario. This means that private consumption in 2005-06 was \$17.8 billion lower due to labour productivity losses caused by presenteeism (2004-05 prices).

Private consumption represents household spending on all goods and services. In Australia, private consumption accounts for 76 per cent of total consumption. Traditionally, when analysing the impacts of a policy change or a phenomenon such as presenteeism on the economy, the focus has been on using GDP to measure the impact on living standards. However, it has long been the standard practice of Econtech to use private consumption as the measure of living standards instead of GDP. This is a better measure because living standards derive from private consumption, not GDP. So, in principle, private consumption is a more appropriate measure of changes in living standards than GDP. Therefore, the best single measure of the impact of presenteeism on living standards is private consumption.

Chart A
National Macro-economic Effects of Presenteeism
(% deviation from baseline)



Source: MM2, Econtech

The negative impact of labour productivity losses stemming from presenteeism flow throughout the economy, leading to a general reduction in the level of exports, imports and investment. Indeed, Chart A shows that, when compared to the No Presenteeism Scenario, exports are lower by 2.8 per cent (equivalent to about \$4.8 billion of exports in 2005/06, 2004-05 prices) and imports are lower by 1.99 per cent (equivalent to about \$4.06 billion of

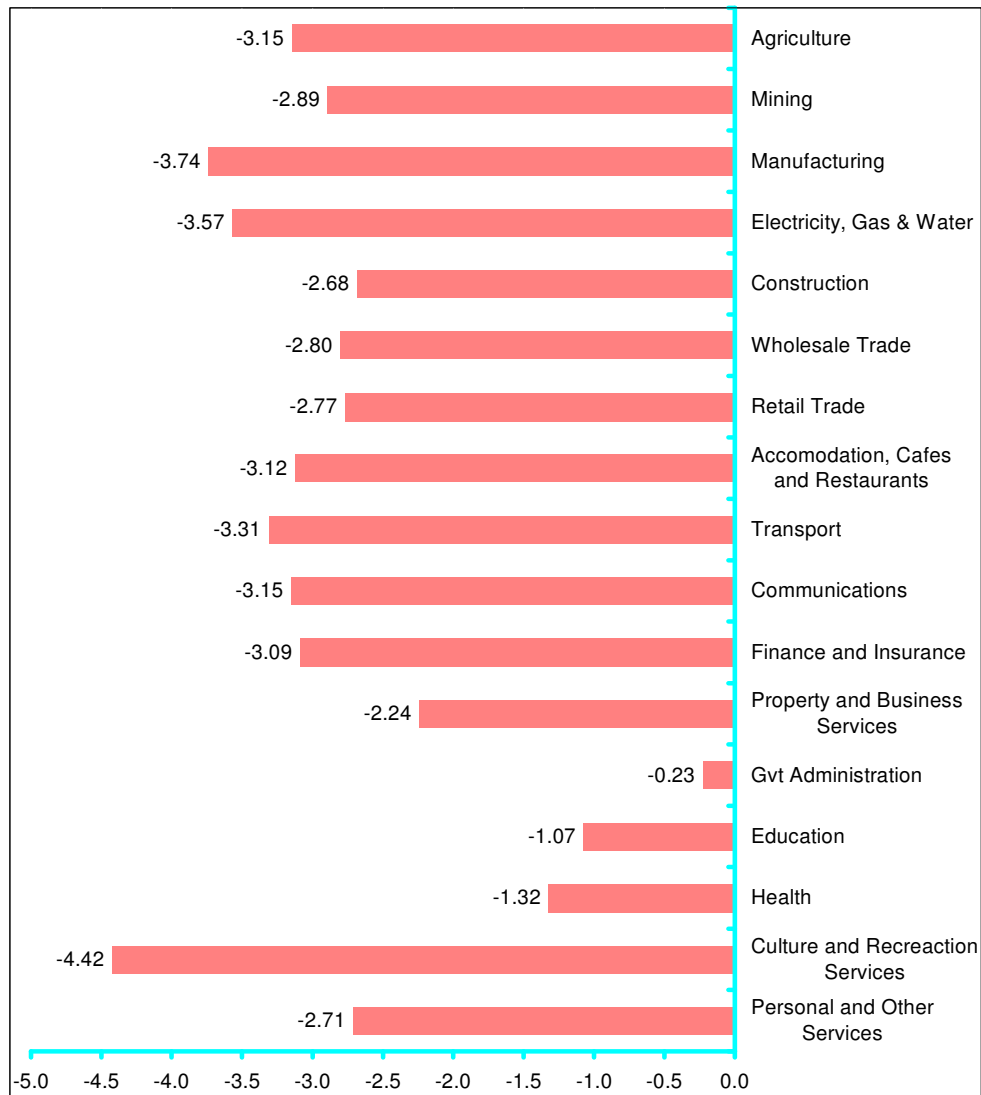
⁵ The disproportionate decrease in private consumption is caused by the fact that public consumption is less responsive to labour productivity changes.

imports in 2005/06, 2004-05 prices).

Chart A also shows the effects of presenteeism on investment. The chart shows that investment is 2.61 per cent lower under the Baseline Scenario, than under the No Presenteeism Scenario. This means that investment in 2005-06 was \$3.7 billion lower due to presenteeism (2004-05 prices).

Chart B shows the average annual cost of presenteeism at the industry level in the long run. While all the industries lose, Chart B shows that the biggest percentage losses are concentrated in the culture and recreation services industry, the manufacturing industry, the electricity, gas and water industry and the transport industry. In contrast to these sectors that depend to a larger degree on the demand of private consumption, those industries that depend largely on public consumption are to a lower degree affected by presenteeism. This is a result of the low responsiveness of public consumption to the labour productivity losses caused by presenteeism.

Chart B
Impact of Presenteeism on Industry Production
 (% deviation from baseline)



Source: MM2, Econtech

The industry that shows the biggest production impact is the culture and recreation services industry. Under the Baseline Scenario (where presenteeism continues to occur at its current rate), this industry shows decrease in production of about 4.4 per cent when compared to the No Presenteeism Scenario. This production effect is mainly caused by a significant loss in labour productivity due to presenteeism and by a disproportionate decrease of private consumption that dominates the demand for products of the culture and recreation services industry.⁶

The manufacturing industry also shows significant production effects. Under the Baseline Scenario, production in this sector is 3.74 per cent lower than under the No Presenteeism Scenario. That is, on-the-job labour productivity losses caused by presenteeism lower the annual production in this industry by 3.74 per cent.

Finally, the electricity, gas and water industry shows a 3.57 per cent decrease in production when compared to the No Presenteeism Scenario. As with the other industries, the production effect in this industry is fuelled by the losses in labour productivity due to presenteeism and the disproportionate decrease of private consumption that constitutes an important demand factor for this industry.

Conclusion

This study estimates the cost to the Australian economy of productivity losses due to presenteeism in the workplace. Importantly, this report can inform policymakers, businesses and health insurers about the magnitude of the problem of presenteeism by providing estimates of the economic impact on businesses and on the Australian economy.

The results presented in this report demonstrate that presenteeism has substantial impacts on productivity and imposes an important economic burden to businesses and to the Australian economy as a whole.

Furthermore, the evidence presented in this report indicates that investments in interventions that improve functioning for individuals with health conditions would have considerable impacts in terms of productivity improvements and on macroeconomic aggregates like GDP. Therefore, it is important that businesses identify cost-effective measures that can be taken to recover some, if not all, of the on-the-job productivity lost to employee medical conditions.

Importantly, investing in employee health can create a win-win situation for employers and employees alike. Employees can enjoy better health and improved quality of life while companies realize more productive employees.

For instance, assuming that the gross-wage sum accounts for 30 per cent of a company's turnover and that the company's presenteeism costs correspond to approximately 3 per cent of the gross-wage sum, a reduction of presenteeism by half would decrease the labour costs from 30 per cent to 29.55 per cent.⁷ This reduction of the wage costs to an employer would

⁶ The culture and recreation services industry comprises four sub-groups: heritage; arts; sports and physical recreation and other culture and leisure, such as gambling or outdoor activities.

⁷ The reduction of the labour costs of a company to 29.55 per cent from 30 per cent is derived by first multiplying the gross wage sum (30 per cent) times the assumed presenteeism costs to the employer (3 per cent of 30 per cent, which equals 0.9 per cent of the total turnover). After calculating the total costs of presenteeism, the costs of a 50 per cent reduction of presenteeism is derived by multiplying the total costs of presenteeism to the employer (0.9 per cent) with 0.5 which equals 0.45 per cent of the total turnover of a

correspond to an increase of its profit margin from five per cent to 5.45 per cent in terms of a company's turnover if the costs savings translate directly into profits. The company profit would rise as result of this reduction by nine percent compared to its previous level.⁸ This simple example illustrates the business case of reducing presenteeism for companies.

The distribution of the productivity gains from reduced presenteeism levels would depend on the share of companies that introduce measures to reduce presenteeism. Those companies that are among the first to introduce presenteeism reducing measures are likely to benefit to a larger degree from presenteeism related productivity gains. In contrast, late adopters of presenteeism reducing measures are likely to benefit to a lower degree of presenteeism reducing measures that translate more likely into higher real wages for employees rather than lower labour costs if a large share of companies has already introduced specific presenteeism lowering programmes.

company.

⁸ This hypothetical example is provided for illustrative purposes only. The figures do not represent any particular Australian company, nor do they reflect the actual gains of reducing presenteeism accruing to any company.

1. Introduction

Presenteeism is defined as the lost productivity that occurs when employees come to work but, as a consequence of illness or other medical conditions, are not fully functioning. Previous research undertaken in the United States shows that presenteeism can decrease individual productivity by one-third or more. Indeed, two studies from the *Journal of the American Medical Association*^{9,10} found that the on-the-job productivity loss resulting from depression and pain was roughly three times greater than the absence-related productivity loss attributed to these conditions.

It is clear that presenteeism represents a problem for employers and a clear cost to a country's economy. This is why, in recent years, Medibank Private has been working to increase awareness of the benefits of workplaces that foster a healthy environment for employees.

To further its advocacy platform in the area of workplace health, Medibank Private commissioned Econtech to estimate the cost to the Australian economy of productivity losses due to presenteeism in the workplace.

This report is structured as follows:

- Section 2 presents an overview on presenteeism.
- Section 3 presents a literature review on the instruments to measure presenteeism and the economic costs of presenteeism.
- Section 4 outlines the methodology used to estimate the economic cost of presenteeism to the Australian economy.
- Section 5 evaluates the economic impact of presenteeism, both the direct and indirect costs, to the Australian economy.
- Section 6 discusses the implications of the results for businesses and highlights the benefits of fostering a healthy workplace.
- Section 7 presents the conclusions.
- Section 8 presents the references used to prepare this report.

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of Medibank Private and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this work or information contained within it for another purpose, please contact us.

The specific purpose of this report is to model the economic costs of presenteeism to the Australian economy.

The findings in this report are subject to unavoidable statistical variation. While all care has

⁹ Walter F. Stewart; Judith A. Ricci; Elsbeth Chee; David Morganstein; Richard Lipton "Lost Productive Time and Cost Due to Common Pain Conditions in the US Workforce", *JAMA*, Nov 2003; 290:2443-2454.

¹⁰ Walter F. Stewart; Judith A. Ricci; Elsbeth Chee; Steven R. Hahn; David Morganstein "Cost of Lost Productive Work Time Among US Workers With Depression", *JAMA*, Jun 2003; 289:3135-3144.

been taken to ensure that the statistical variation is kept to a minimum, care should be used whenever using this information. This report only takes into account information available to Econtech up to the date of this report and so its findings may be affected by new information. Should you require clarification of any material, please contact us.

2. Presenteeism Overview

In the early nineties, Professor Cary Cooper of the Manchester University introduced presenteeism as the antonym to absenteeism. Presenteeism is defined as the productivity loss that occurs when employees come to work but, as a consequence of illness or other medical conditions, are not fully functioning. The costs of absenteeism, the productivity loss which occurs if workers are on sick leave, are obvious and can be easily measured by the sick leave days of employees. In contrast, the costs of presenteeism are less obvious and more complicated to measure.

The broad definition of presenteeism as ‘any’ on-the-job productivity loss related to ‘any’ medical condition is very general. Therefore, this section classifies presenteeism into different categories according to the type of the health condition causing it and the frequency of occurrence. This classification into categories is presented in Table 2.1.

Table 2.1
Presenteeism Distinguished According to its Cause and Frequency

	Type of health condition	
Frequency of occurrence	Chronic mental health conditions (CAT I)	Chronic physical health conditions (CAT II)
	Episodic mental health conditions (CAT III)	Episodic physical health conditions (CAT IV)

Source: Econtech

The different types of presenteeism shown in Table 2.1 are distinguished between either mental or physical health conditions and according to the frequency of occurrence, between either chronic or episodic health conditions. This distinction enables us to discuss in a more structured way the different kinds of presenteeism and the potential productivity improvement for each kind of presenteeism. The different types of presenteeism are described in more detail below.

- *CAT I:* All health conditions which are of mental origin and chronic, i.e. that occur recurrently or are long-lasting. This category of presenteeism includes all mental illnesses and diseases depending on the frequency of occurrence.
- *CAT II:* This category of presenteeism includes all health conditions which are persistent and of physical origin. The inclusion of a health condition in this category depends on the frequency of occurrence. Whether a health condition is included in this category depends mainly on its causation. Health conditions which are caused by unhealthy habits, workplace settings, workplace environments and any other condition which emerges over a long period rather than at a specific point in time (such as sports injuries), will be likely included in category CAT II.
- *CAT III:* Mental health conditions which are episodically occurring. In contrast to CAT I, this category comprises conditions which do not persistently affect employees. Examples for this health condition are a temporary burn out syndrome, exhaustion and non-persistent depressions.
- *CAT IV:* This category comprises episodic physical health conditions which occur irregularly and are of temporary nature. In particular, this group includes periodical and epidemical illnesses like influenza.

The information presented above provided a first overview of the different types of presenteeism that can exist. The rest of this section will discuss the causes of presenteeism.

Since presenteeism includes all on-the-job productivity losses, the different causes of presenteeism are very diverse. The following discussion of the causes of presenteeism concentrates on the *main* causes of presenteeism. The main causes of presenteeism are now explained in turn.

1. *Unhealthy life styles.* A major determinant of a person's health condition is her lifestyle. A healthy diet, regular exercise, non-smoking and non-drinking influence the health status of a person and can result in a decreased probability of the occurrence of any health condition which cause presenteeism. Especially, the probability of occurrence of chronic physical health conditions can be reduced by maintaining a healthy lifestyle (e.g. regular swimming prevents chronic back pains, non-smoking reduces the probability of cancer, a healthy diet reduces obesity, heart problems, high blood pressure and related health conditions).
2. *Workers with illnesses going to work.* Ill workers who go to work are another cause of presenteeism. Ill workers suffer from lower productivity and can spread infectious diseases, like influenza and cold, among their co-workers. An epidemic caused by a single ill worker can impose serious costs on a company, which can be several times higher than the direct costs of the productivity lost of the specific worker.
3. *Allergies and asthma.* Workers suffering from allergies or asthma can be seriously impaired in their workplace performance by these diseases. During the hay fever season each year or due to the workplace environment, some employees could suffer from allergies and asthma and impose presenteeism costs to the company.
4. *Missing work-life balance and job related stress.* Job dissatisfaction and stress can cause serious mental problems on individuals and result in higher probabilities of both chronic and episodic mental health conditions (like the burn-out syndrome or depressions). While the individual risk of a mental health depression depends to a large degree on individual predisposition, the workplace environment and work climate can also influence the risk of occurrence of a mental health condition.

2.1 The Costs of Presenteeism

As previously mentioned, the costs of presenteeism are less easily observed and measured by companies than the costs of absenteeism. Nevertheless, in recent years, several studies have analysed the costs of presenteeism to companies and presented figures on the magnitude of presenteeism costs, both in absolute terms and in relation to absenteeism.

For instance, a study administered by AdvancePCS in the United States estimated the direct costs of presenteeism to employers to be around US \$180 billion, which corresponds to approximately 1.7 per cent of the GDP of the US. In a related approach, Goetzel et al. (2004) estimated that the costs of presenteeism amount to US \$1,566 per employee per year for the top 10 health conditions¹¹. This corresponds to approximately 3 per cent of the gross wage sum that a company pays on average. The results of these studies illustrate the potential high savings that a company can achieve by addressing presenteeism.

¹¹ Average loss per condition is US \$156.66 per employee per year (Goetzel et al. 2004, pp 408, Table 4B). Thus, average cost for the top 10 health conditions is US \$1,566 per employee per year.

For instance, assuming that the gross-wage sum accounts for 30 per cent of a company's turnover and that the company's presenteeism costs correspond to approximately 3 per cent of the gross-wage sum, a reduction of presenteeism by half would decrease the labour costs from 30 per cent to 29.55 per cent.¹² This reduction of the wage costs to an employer would correspond to an increase of its profit margin from five per cent to 5.45 per cent in terms of a company's turnover if the costs savings translate directly into profits. The company profit would rise as result of this reduction by nine percent compared to its previous level.¹³ This simple example illustrates the business case of reducing presenteeism for companies.

¹² The reduction of the labour costs of a company to 29.55 per cent from 30 per cent is derived by first multiplying the gross wage sum (30 per cent) times the assumed presenteeism costs to the employer (3 per cent of 30 per cent, which equals 0.9 per cent of the total turnover). After calculating the total costs of presenteeism, the costs of a 50 per cent reduction of presenteeism is derived by multiplying the total costs of presenteeism to the employer (0.9 per cent) with 0.5 which equals 0.45 per cent of the total turnover of a company.

¹³ This hypothetical example is provided for illustrative purposes only. The figures do not represent any particular Australian company, nor do they reflect the actual gains of reducing presenteeism accruing to any company.

3. Literature Review

This section reviews and summarizes a selection of studies on the costs of presenteeism and on the instruments used to measure it. Whilst this section intends to provide an overview on the research on presenteeism, the list of studies included in this section is not exhaustive and does not claim to provide an encompassing overview of all research in this area.

Research on the costs of presenteeism is a relatively new field and hence most of the studies cited in this section have been published in the last five years. Comprehensive estimates of the costs of presenteeism are mainly restricted to the United States. Indeed, the international evidence on the costs of presenteeism is very limited and restricts itself mostly to the estimation of the costs of presenteeism for specific companies or industries (cf. Tilse and Sanderson, 2005) rather than estimating the costs of presenteeism to the economy.

A common feature of the studies that deal with the costs of presenteeism is that only the direct costs of presenteeism are estimated. While the estimation of the loss of productive time and the related presenteeism costs are in the centre of interest for a company, from an economic point of view, the indirect costs of presenteeism (which occur due to changes in labour demand and supply) are also of interest since they can account for a considerable share of the total costs. For instance, Koopmanschap et al. (1995) estimated that the indirect costs of absenteeism account for at least 25 per cent of the total costs.

This section is structured as follows. Section 3.1 examines the instruments used to capture and measure presenteeism and discusses briefly their validity. Section 3.2 presents an overview of studies dealing with the costs of presenteeism.

3.1 Instruments to Measure Presenteeism

The measurement of presenteeism is one of the most important tasks for any study dealing with the economic costs of presenteeism. In the last decade numerous instruments have been developed to measure presenteeism and its causation, i.e. the medical conditions related to the loss of worker productivity. In a recent attempt, Lofland et al. (2004) reviewed a set of various survey questionnaires that measure presenteeism with respect to their applicability and validity to estimate the costs of presenteeism. The findings of this study generally encourage the validity of the questionnaires reviewed. The authors conclude that more than half of the categorical questionnaires are designed in a way that allows readily analysing the monetary costs of presenteeism by transforming the gathered data.

Table 3.1 presents a collection of prominent instruments to measure presenteeism. As shown in the table, most of the instruments rely on phone interviews and self-reported surveys to assess the magnitude and relevance of presenteeism. The survey-based collection design of the instruments allows collecting data from a large number of workers and increases the representativeness of studies that use self-reported instruments. Nonetheless, the higher representativeness achieved through a large sample size comes at the price of presenteeism measures which rely on the self-evaluation of workers.

**Table 3.1
Instruments for Measurement of Presenteeism**

Name of Instrument	Content	Comments
American Productivity Audit (APA)	46 questions via phone survey with some variability	Measures absenteeism and presenteeism
Health Limitations Questionnaire (HLiQ)	23 item questionnaire	Captures absenteeism and presenteeism
Healthy People/Productive Community Survey (HPCS)	200 item questionnaire using a Likert scale	Measures absenteeism and presenteeism
Health and Performance Questionnaire (HPQ)	12 item questionnaire using Likert scale	Measures absenteeism and presenteeism
Work Productivity Short Inventory (WPSI)	66 questions at maximum	Captures absenteeism and presenteeism and care giver demands
Angina-Related Limitations at Work Questionnaire (ALWQ)	17 item questionnaire using Likert scale	Captures absenteeism and presenteeism
Endicott Work Productivity Scale (EWPS)	25 item self-scored questionnaire	Captures absenteeism and presenteeism
Health and Labour Questionnaire (HLaQ)	7 presenteeism questions plus 3 additional domains	Measures absenteeism, presenteeism, unpaid production and work impediments
Health and Work Questionnaire (HWQ)	27 questions in 6 sub-scales	Measures absenteeism, presenteeism and work performance
Health and Work Performance Questionnaire (WHO)	88 questions	Captures absenteeism and presenteeism and critical event information
Migraine Work and Productivity Loss Questionnaire (MWPLQ)	23 questions	Captures absenteeism and presenteeism
Osterhaus Technique (OT)	12 questions	Captures absenteeism and presenteeism
Standard Presenteeism Scale (SPS)	6 questions using a Likert scale	Captures presenteeism
Unnamed Hepatitis Instrument (UHI)	3 questions	Captures absenteeism and presenteeism
Work Limitations Questionnaire (WLQ)	25 questions	Captures presenteeism

Name of Instrument	Content	Comments
Work Productivity and Activity Impairment Questionnaire (WPAIQ)	6 questions	Captures absenteeism and presenteeism
Worker Productivity Index (WPI)	Directly measures computer activity of customer service staff	Captures absenteeism and presenteeism

Source: Chapman (2005), Goetzel et al. (2004).

The studies presented in Table 3.1 provided Econtech with a useful source of estimated parameters relating to the impact of presenteeism on productivity. This information, in particular the estimates produced by Goetzel et al (2004), is used in subsequent sections to model the cost of presenteeism to Australia. To quantify the validity of the survey instrument used in this analysis, Econtech compared the presenteeism measure presented in Goetzel et al (2004), which is a combination of the APA, the HLiQ, the HCPS and the WPSI, with the Worker Productivity Index (WPI) which measures presenteeism by observing the computer activity of workers. The WPI is only used in a few studies that estimate presenteeism costs related to allergies. Therefore, this validation exercise is not comprehensive for all the medical conditions included in this Econtech study.

The validation exercise conducted by Econtech shows that both Goetzel et al's measure and the WPI deliver a comparable figure of presenteeism costs related to allergies. Indeed, Goetzel et al estimated the productivity losses related to allergies to be 10.9 per cent, while the study using the WPI estimated the productivity losses related to allergies to be 10.0 per cent. This finding increases the confidence in the validity of Goetzel et al's estimates and consequently, the validity of the costs of presenteeism for the Australian economy estimated by Econtech using Goetzel et al's figures.

3.2 Economic Costs of Presenteeism

Using the various instruments to measure presenteeism, several studies have estimated the costs of presenteeism for employers and the economy. This section presents an overview of such studies and it is divided in two subsections. The first subsection presents research evidence on the costs of presenteeism for a broad range of medical conditions. In contrast to the first subsection (that deals with the quantification of the costs of presenteeism caused by a wide range of health conditions), the second subsection presents research evidence on the costs of presenteeism caused by selected medical conditions.

Evidence on Costs of Presenteeism for a Wide Range of Medical Conditions

Table 3.2 contains a selection of studies that estimate the total costs of presenteeism covering a wide range of health conditions. The majority of the studies presented in Table 3.2 deal with the costs of presenteeism for the whole US workforce. The exceptions are a study by Tilse and Sanderson (2005) that focuses on the costs of presenteeism in Australian call centres, and a study by Ozminkowski et al. (2005) that analyses presenteeism costs for a large telecommunication company.

Table 3.2
Studies on Total Costs of Presenteeism

Authors	Subject	Findings
Stewart et al. (2003a)	Estimation of presenteeism costs	Estimated presenteeism costs for 10 conditions equal \$180 billion, higher than absenteeism costs
Goetzel et al. (2004).	Meta study on the costs of presenteeism	Presenteeism costs higher than absenteeism costs and for most medical conditions higher than medical costs. Overall presenteeism costs more than \$1500 per worker per year
Collins et al. (2005)	Estimation of health conditions, work performance and economic costs	Presenteeism costs exceed combined costs of absenteeism and medical treatment
Berger et al. (2003)	Estimation of presenteeism costs	Absenteeism and presenteeism costs account for 5-10 per cent loss of effective workforce
Ozminkowski et al. (2004)	Presenteeism estimates and association with health status	Presenteeism costs approximately \$2000-\$2800 per worker per year. The costs are associated with perceived health status and specific medical conditions
Tilse and Sanderson (2005)	Costs of presenteeism in Australian call centres	Estimated presenteeism costs of \$397 per person for a four week-period for the analysed companies

Source: Econtech

As can be seen in Table 3.2, the relevance of presenteeism is highlighted by several studies that found that presenteeism costs exceed absenteeism costs. For instance, Stewart et al. (2003a) estimate that the costs of presenteeism are three times higher than the costs of absenteeism.

In general, the studies presented in Table 3.2 found evidence that a considerable economic burden is related to presenteeism. Goetzel et al. (2004) and Stewart et al. (2003) estimate that the costs of presenteeism amount to up to 3 per cent of the gross wage sum paid to workers in the US. This illustrates the potential productivity improvements that can be achieved by companies and the economy, if presenteeism is reduced.

The subsequent discussion presents the findings of two studies in detail. The reason for this is that these two studies rely on a superior database when compared to other studies presented in Table 3.2 which have a smaller sample size. The first study is the AdvancePCS study of Stewart et al. (2003a), which is the best-known study in the public debate on this issue. The second study is by Goetzel et al. (2004). This second study is a meta-analysis that uses data from several studies. This means that this study can deliver a more

comprehensive picture on the magnitude and composition of presenteeism costs than most other studies.

The AdvancePCS “American Productivity Audit”, Stewart et al (2003a)

The most prominent and often cited study that estimates the costs of presenteeism for the economy is a study administered by AdvancePCS. This study used the APA survey instrument to construct a representative sample of the US workforce with more than 30,000 interviewed persons. The aim of this study was to measure the lost of productive time for the following health conditions: allergies, asthma/skin allergies, cold/flu, dental problems, fatigue, gastrointestinal problems, headache/pain, menstrual pain, prescription drug side/effects, and feeling sad/blue. In this study, Stewart et al. (2003a) estimated the annual productivity losses of medical conditions for the US economy to amount to more than US \$180 billion for the five most common medical conditions (headache/pain, cold/flu, fatigue/sad-blue, gastrointestinal problems and arthritis) and more than US \$250 billion for all medical conditions. According to the study, 72 per cent of the costs (or approximately US \$180 billion) can be attributed to on-the-job productivity losses, i.e. presenteeism. This estimated productivity loss for the US economy caused by presenteeism corresponds to approximately 1.7 per cent of the annual GDP of the United States.

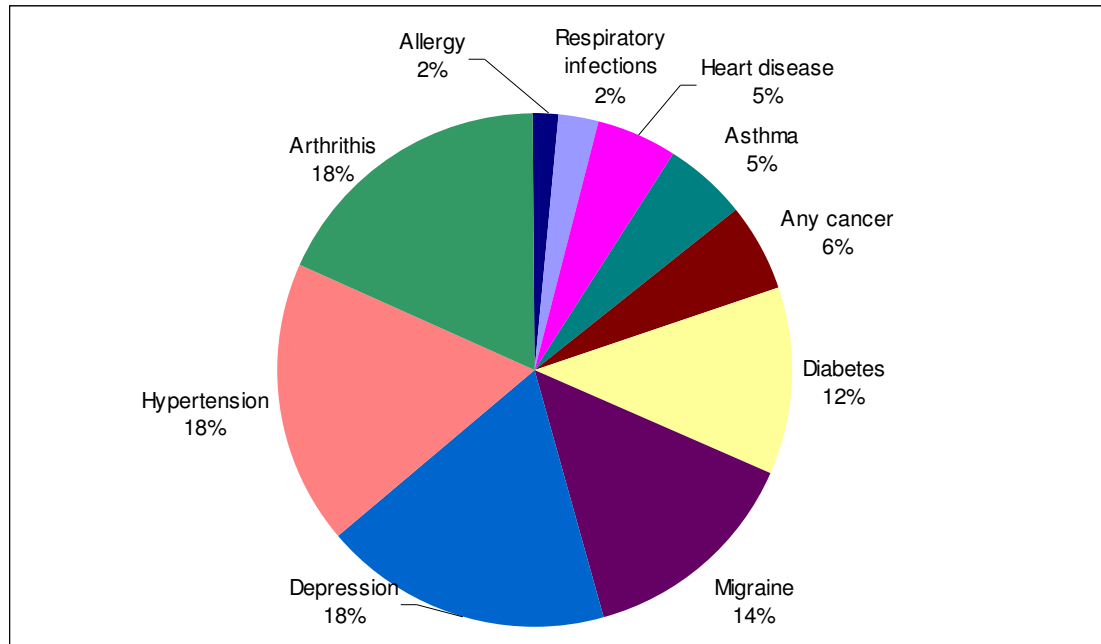
The Goetzel et al. (2004) meta-analysis¹⁴

In 2004, Goetzel et al extended the AdvancePCS study by conducting a meta-analysis. This study estimated the costs of presenteeism of the top 10 mental health conditions and the top 20 physical health conditions according to the Health and Productivity Management Administrative Claims Database. After aggregating these conditions into 10 categories, Goetzel et al. (2004) used data from the APA, the HCPS, the McArthur Foundation Midlife Development in the United States Survey, the (Bank One) Worker Productivity Index and a survey using the WPSI, to estimate the costs of presenteeism related to the top 10 mental health conditions and the top 20 physical health conditions in the US. The study estimated that the costs to the US economy due to presenteeism are approximately 2.5 per cent of GDP. Interestingly, this estimate is considerably higher than the AdvancePCS study, which found that presenteeism costs the US economy approximately 1.7 per cent of GDP.

The distribution of presenteeism costs according to medical conditions has also been in the focus of some studies which estimate the total costs of presenteeism. Chart 3.1 shows the estimated cost shares of the total costs of presenteeism for the specific health conditions. As shown in the chart, the five health conditions with the highest cost shares are depression, hypertension, arthritis, migraine and diabetes. These conditions account for approximately 75 per cent of the costs of presenteeism as estimated by Goetzel et al. (2004). This illustrates the promising potential of employer health programs focusing on the reduction of presenteeism related to these medical conditions.

¹⁴ A meta-analysis is a statistical procedure that uses results of several studies. It synthesizes results of several independent studies which addressed a set of related hypothesis. The advantage of a meta-analysis is that it incorporates comprehensive research evidence of several sources and provides an accurate estimate of effects. Particularly, methodological shortcomings of single studies, like the small sample size could be eased by the use of a meta-analysis of a wide-variety of studies.

Chart 3.1
Cost Shares of Health Conditions of Total Presenteeism Costs



Source: Based on Table 4.B of Goetzel et al. (2004).

Evidence on the Costs of Presenteeism for Selected Medical Conditions

In addition to studies which estimate the costs of presenteeism for a broad range of health conditions, there are several studies that concentrate on the effect of specific health conditions on workplace productivity. Table 3.3 presents a selection of studies which focused on presenteeism-related costs of selected health conditions. Of the studies presented in this table, two studies will be mentioned explicitly due their focus. Stewart et al. (2003) and Greenberg et al. (1999) analysed the presenteeism costs of back pains and anxiety disorders. These conditions are not included in the analysis of Stewart et al. (2003a) or Goetzel et al. (2004). Taking into account that both studies found considerable presenteeism costs related to back pains and anxiety disorders (US \$31 billion and US \$4.1 billion respectively), a comprehensive analysis of the economic burden of presenteeism has to consider these two neglected medical conditions.

Table 3.3
Studies on Costs of Presenteeism for Specific Health Conditions

Authors	Subject	Finding
Adler et al. (2004)	Impact of dysthymia ¹⁵	On-the-job productivity loss of patients suffering from dysthymia is 3.5 per cent higher than in a depression-free control group.
Pelletier et al. (2004)	Health risk and work productivity	Reducing one health risks is associated with lower presenteeism (approximately 9 per cent).

¹⁵ Dysthymia is a form of chronic depression.

Authors	Subject	Finding
Burton et al. (2004)	Presenteeism and its association with medical conditions	Association between mental and physical medical conditions and physical and interpersonal functioning.
Kessler et al. (2004)	Overview on methodology for analysing presenteeism using survey data	Provides innovative approaches to estimate the presenteeism costs using survey data.
Wang et al. (2004)	Association of chronic conditions and presenteeism	Presenteeism more costly than absenteeism; selected chronic conditions affect presenteeism.
Stewart et al. (2003b)	Costs estimation of common pain conditions	Presenteeism accounts for 76.6 per cent of lost productive time. Total costs of common pain are \$61.2 billion.
Stewart et al. (2003c)	Costs estimation of presenteeism caused by depression	Presenteeism is more important than absenteeism, costs of depression is approximately \$31 billion.
Burton et al. (2003)	Estimation of migraine costs for a large US company	Costs for employer (80,000 employees financial company) are over 420 million.
Kessler et al. (2002)	Estimation of relationship of chronic conditions and work impairment	2.5 billion days are lost per year in the use due to work impairment.
Greenberg et al. (1999)	Estimation of costs of anxiety disorders	Presenteeism costs of anxiety disorders equal \$4.1 billion (10 per cent of overall costs)
Burton et al. (2001)	Impact of allergies on worker productivity	Productivity loss of workers is 10 per cent during the period they suffer from allergies

Source: Econtech

Whilst the studies presented in this literature review deliver valuable evidence on the direct costs of presenteeism to the employer, they did not include the indirect effects of presenteeism. These indirect effects arise due to lower workplace productivity levels and the subsequent changes of labour supply, labour demand and production levels. Importantly, in an economic estimation of the costs of absenteeism for the Dutch economy, Koopmanschap et al. (1995) highlighted the importance of these indirect effects, which according to their results account for 25 to 33 per cent of the overall effects.

In comparison to the studies presented in this review, this Econtech study uses the MM2 model to estimate the direct and indirect costs of presenteeism.

4. Modelling Approach

This section provides details of the modelling approach used to estimate the economic costs of presenteeism to the Australian economy. The section is structured as follows. Section 4.1 outlines the advantages of Econtech's modelling approach over previous work. Section 4.2 outlines the scenarios that are simulated using Econtech's MM2 model to quantify the economic costs of presenteeism to the Australian economy. Section 4.3 outlines the main data inputs that Econtech uses to build the alternative scenarios and describes how these inputs are derived. Section 4.4 discusses the main features of the economic model (MM2) that is used to estimate economic costs of presenteeism to the Australian economy.

4.1 Comparison with previous work

To our knowledge, this Econtech study is the first attempt to estimate the costs of presenteeism on the Australian economy. The estimated costs of presenteeism provided in this study include the following three components:

- the direct costs faced by employers due to the on-the-job productivity losses caused by presenteeism;
- the indirect costs to the Australian economy due to adjustments of complementary input factors to lower labour productivity levels caused by presenteeism; and
- the indirect costs to the Australian economy arising from changes in terms of capital intensity^{16,17} other second round effects like trade effects.

The second and third components mentioned above represent the indirect costs of presenteeism. They have not been estimated before in either international studies on the costs of presenteeism, or in national studies on the costs of presenteeism. Neglecting the indirect effects can seriously underestimate the total costs of presenteeism to the economy, as it has been evidenced by Koopmanschap et al. (1995) who estimated the costs of a related phenomenon, absenteeism. Indeed, Koopmanschap et al. (1995) suggest that the indirect costs of absenteeism account for 25 to 33 per cent of the total costs of absenteeism.

In comparison to previous studies, the approach employed by Econtech in this study overcomes the above mentioned shortcomings by estimating both the direct and indirect effects of presenteeism on the Australian economy. This is done by incorporating the labour productivity losses caused by presenteeism into Econtech's MM2 model. The MM2 model considers the second round effects of productivity losses by adjusting the Australian capital stock to the new labour productivity level and by incorporating the effects of the decreased competitiveness of the Australian economy.

4.2 Scenarios

To simulate the economic impacts of labour productivity losses related to presenteeism on the Australian economy, the following two scenarios are modelled.

¹⁶ Capital intensity is the term in economics for the amount of capital present in relation to other factors of production, especially labour (i.e. the amount of capital per unit of labour input).

¹⁷ This effect arises from a modelling assumption that causes government consumption to be less responsive to changes of labour efficiency. As a result we observe a reduction of capital intensity of the whole economy with adverse effects on GDP.

- The “Baseline Scenario” which reflects the current situation, where presenteeism continues to occur at its current rate.
- The “No Presenteeism Scenario” which reflects a situation where there is no presenteeism and hence labour productivity is improved across all sectors.

Differences in economic outcomes between the Baseline Scenario and the No Presenteeism Scenario are calculated to determine the economic costs of presenteeism.

The main inputs for each of the scenarios are discussed in detail below.

4.3 Model Inputs

This study considers the presenteeism resulting from 12 different medical conditions. These are allergies, arthritis, asthma, cancer, depression, diabetes, heart disease, hypertension, migraine/headache, respiratory disorders, skin conditions and back, neck or spinal problems.

The main input used by Econtech for the economic modelling is an estimate of the overall labour productivity loss caused by presenteeism. This figure is estimated by Econtech in the following way. First, Econtech estimates the loss in aggregate labour productivity resulting for each medical condition. For each medical condition, this involves applying Australian data on the prevalence of the disease in people of working age to international estimates of the on-the-job productivity losses from the disease and an adjustment factor reflecting the frequency of a presenteeism effect from the disease. Then, Econtech uses these estimates of lost labour productivity for each medical condition to calculate the overall labour productivity loss caused by presenteeism.

Box 4.1

Coverage of presenteeism in this study

The presenteeism range in this study draws heavily on Goetzel et al. (2004). Goetzel et al. (2004) include in their definition of presenteeism those medical conditions which cause the highest medical costs to employers. This selection generally includes chronic conditions and neglects presenteeism costs due to epidemical illnesses like influenza, which more likely do not cause direct medical costs to the employer.

The presenteeism estimates in this study represent estimates of presenteeism costs due to chronic health conditions and not the combined presenteeism costs of chronic and episodic, epidemical health conditions.

Presenteeism costs due to obesity are not explicitly included as obesity-presenteeism costs in this study. Rather than having an own obesity category, this study includes health conditions which can be caused by obesity, like heart disease, diabetes and hypertension.

Table 4.1 presents the literature estimates of average on-the job productivity losses due to presenteeism used to produce the shocks to MM2. These figures reflect the productivity losses due to presenteeism per employee per year, for employees who have the condition over a multi-day or multi-week period.

Table 4.1
Literature Estimates of Productivity Losses for Selected Medical Conditions

Medical Condition	Gross Average Labour Productivity Loss Due to Presenteeism (pa, %)
Allergy	10.9% (a)
Arthritis	11.2% (a)
Asthma	11.0% (a)
Any Cancer	8.5% (a)
Depression	15.3% (a)
Diabetes	11.4% (a)
Heart Disease	6.8% (a)
Hypertension	6.9% (a)
Migraine/headache	20.5% (a)
Respiratory Disorders	10.9% (a)
Back, neck or spinal problems	11.4% (b)
Eczema or other skin condition	11.0% (a) (c)

Notes:

(a) Source: Goetzel et al. (2004)

(b) Source: Estimated by Econtech using information provided in Goetzel et al. (2004) and Stewart et al. (2003)

(c) Goetzel et al. (2004) aggregated asthma and skin allergies into one category. Hence, this study assumes that average productivity loss is the same.

To calculate the overall labour productivity loss that was introduced into MM2, the estimates presented in Table 4.1 were adjusted by two factors. First, Econtech adjusted the estimates with a ‘presenteeism frequency factor’ that reflects the frequency¹⁸ with which a person is affected by the medical condition. The presenteeism frequency factor for each medical condition is presented in Table 4.2.

Table 4.2
Presenteeism Frequency Factors
(Days per year that a person was impaired by a medical condition)

Medical Condition	Presenteeism Frequency Factor
Allergy	0.18
Arthritis	0.41
Asthma	0.18
Any Cancer	1.00
Depression	0.27
Diabetes	0.80
Heart Disease	0.36
Hypertension	0.65
Migraine/headache	0.08
Respiratory Disorders	0.06
Back, neck or spinal problems	0.09
Eczema or other skin condition	0.18

Source: Estimated by Econtech using information provided in Goetzel et al. (2004) and Stewart et al. (2003)

¹⁸ The presenteeism frequency factor is equal to the average days per year that a person was impaired by a medical condition divided by the total days eligible to work per year (240).

The second factor used to adjust the literature estimates presented in Table 4.1 is the prevalence of medical conditions in employed people. Econtech estimated this prevalence figure using data from the National Health Survey 2004-05 on the number of persons with medical conditions by age group, and data on the number of people employed by age group in 2004-05 from the ABS. By using these two pieces of information to calculate the prevalence of medical conditions in employed people, Econtech accounted for two key issues:

- that older people is more prone to illness; and
- that a smaller number of old people is employed.

Econtech's estimates of the prevalence of medical conditions in employed people are presented in Table 4.3 below.

Table 4.3
Estimates of the Prevalence of Medical Conditions in Employed People

Medical Condition	Prevalence ^(a)
Allergy	24.8%
Arthritis	2.1%
Asthma	10.1%
Any Cancer	1.3%
Depression	12.1% ^(b)
Diabetes	2.5%
Heart Disease	2.1%
Hypertension	7.8%
Migraine/headache	9.0%
Respiratory Disorders	13.8% ^(c)
Back, neck or spinal problems	18.3%
Eczema or other skin condition	3.9% ^(d)

Source: Estimated by Econtech using data from the National Health Survey 2004-05 and ABS employment data for the year 2004-05.

Notes:

(a) Reflects prevalence of illness in employed people. Assumes employed persons are 15 years and over.

(b) Includes all mental & behavioural problems

(c) Includes: Bronchitis, emphysema, chronic sinusitis, other diseases of the respiratory system and symptoms and signs involving the respiratory system.

(d) Includes all diseases of the skin.

After adjusting the figures presented in Table 4.1 with the frequency and prevalence factors described above, Econtech estimated the overall labour productivity loss associated with presenteeism that was introduced into MM2. This estimate reflects the labour productivity losses caused by the main¹⁹ medical conditions that are the focus of this report. These estimates are presented in Table 4.4.

As shown in Table 4.4, Econtech estimates that the overall average productivity loss caused by presenteeism is about 2.54 per cent. This figure was introduced into MM2 to estimate the economy-wide impacts of presenteeism in Australia. An average productivity loss of 2.54

¹⁹ The term 'main' is used to indicate the twelve medical conditions as identified earlier, and focussed on throughout the report.

per cent per worker corresponds to a loss of six working days per worker per year for an average Australian worker. Furthermore, an average productivity loss of 2.54 per cent means that presenteeism costs amount to \$1,377 per employee per year for the top 10 health conditions²⁰.

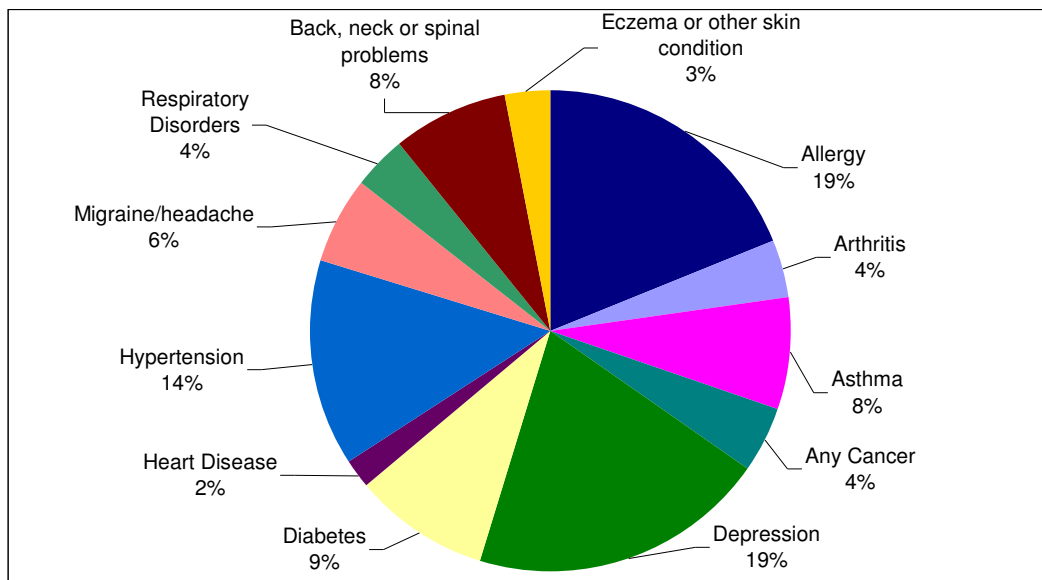
Table 4.4
Adjusted Labour Productivity Loss Estimates

Medical Condition	Adjusted Labour Productivity Loss in Australia due to Presenteeism (pa, %)
Allergy	0.48%
Arthritis	0.10%
Asthma	0.20%
Any Cancer	0.11%
Depression	0.51%
Diabetes	0.23%
Heart Disease	0.05%
Hypertension	0.35%
Migraine/headache	0.15%
Respiratory Disorders	0.10%
Back, neck or spinal problems	0.20%
Eczema or other skin condition	0.08%
Overall Productivity Loss	2.54%

Source: Econtech estimates

For illustration purposes, Chart 4.1 shows the contribution that each medical condition make to the overall productivity loss of 2.54 per cent shown in Table 4.4.

Chart 4.1
Contribution of Medical Conditions to Overall Productivity Loss



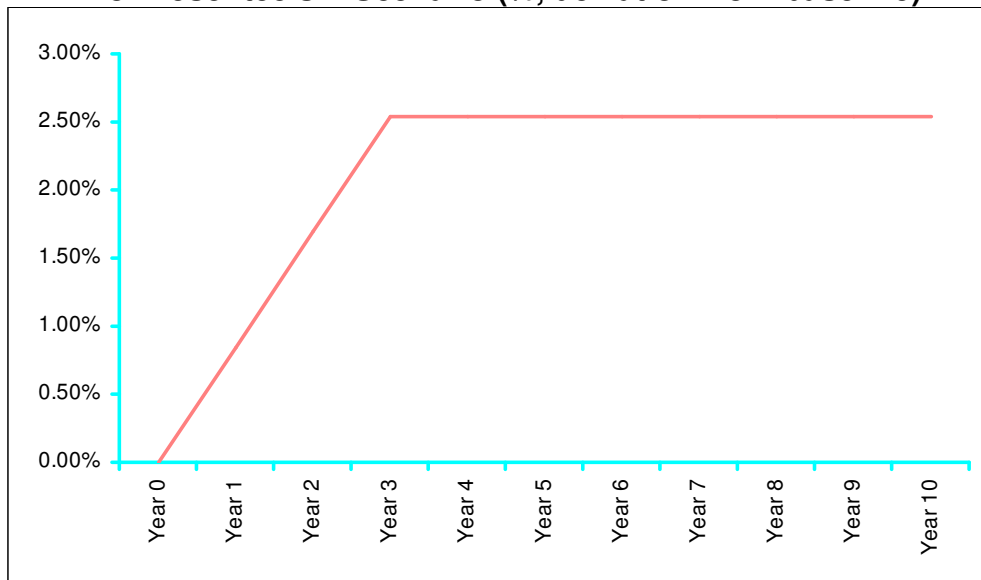
Source: Econtech estimates

Note: Percentages refer to the contribution that each medical condition make to the overall productivity loss of 2.54 per cent as shown in Table 4.4.

²⁰ Assumes average weekly earnings of \$1,041.60 (Source: 2007 Yearbook Australia, ABS, pp 180) for 52 weeks.

Importantly, to model the No Presenteeism Scenario described in Section 4.2, Econtech assumed that the labour productivity improvement stemming from the elimination of presenteeism (i.e. an increase in labour productivity across all sectors of about 2.54 per cent) phases out in a period of three years (twelve quarters). Chart 4.2 illustrates the labour productivity improvement across all sectors under the No Presenteeism scenario relative to the Baseline Scenario.

Chart 4.2
Labour Productivity Improvement Across all Sectors under
No Presenteeism Scenario (% deviation from baseline)



Source: Econtech estimates

4.4 MM2 Model

The economic cost of presenteeism on the Australian economy was estimated using Econtech's MM2 model. MM2 is a fully integrated macro-industry econometric model which can be used to fully capture both the direct and indirect impacts of presenteeism on the Australian economy over time. MM2 is designed for macroeconomic forecasting and policy analysis and also contains broad industry detail.

MM2 has the following important features that make it well suited for the analysis in this report.

- MM2 is a macro Computable General Equilibrium (CGE) model that fully recognises the interrelationships between the supply and demand sides of the economy. The model recognises that the demand side is important in influencing economic activity in the short term, but at the same time they converge to the long term of a CGE model.
- The MM2 has been developed to be consistent with Australian data. Equation dynamics were developed by applying the general to specific approach in an error correction framework. The equations were subjected to a battery of diagnostic testing.
- For consistency with economic theory, the MM2 has long-run properties of steady state growth, profit maximisation, external balance, fiscal balance, and equilibrium

rates of inflation and unemployment. The theory-related dynamic properties of the MM2 include rational expectations in financial markets, and a hierarchical adjustment process featuring a Keynesian short run, a classical medium run, and a neoclassical long run.

- The supply side of the MM2 is just as important as its demand side. Thus Gross Domestic Product (GDP) on the production side is modelled in some detail, as well as the expenditure side. In fact, the modelling of production complements, and fully-integrates, with the modelling of expenditure. GDP on the production side is disaggregated into the 18 broad Australian and New Zealand Standard Industry Classifications (ANZSIC) industries, linked together through an input-output table.

MM2 is based on the common view that while demand shocks may affect economic activity in the short term, in the long term economic activity is supply driven. Specifically, in long-run equilibrium:

- the unemployment rate converges to a NAIRU (non-accelerating inflation rate of unemployment);
- economic growth is steady and balanced; and
- the exchange rate appreciates/depreciates at a steady rate, allowing domestic inflation to be permanently below/above foreign inflation.

More information about MM2 is presented in Attachment A

5. Economic Impact of Presenteeism

Section 4 described the scenarios that were simulated using MM2, outlined the main data inputs that Econtech used to build the scenarios and described how these inputs were derived. This section provides estimates of the direct and the economy-wide impacts of labour productivity losses due to presenteeism. Section 5.1 describes the direct impacts of presenteeism. Section 5.2 describes the economy-wide impacts of presenteeism. Section 5.3 describes the industry-specific impacts of presenteeism.

This Econtech study estimated two kinds of presenteeism costs, the costs of presenteeism to the employer (direct costs) and the costs of presenteeism to the economy (which include the direct and indirect costs).

With respect to the costs of presenteeism to the employer, we refer to the concept of foregone earnings/wage costs savings to the employer and interpret productivity in terms of labour productivity.

With respect to the costs of presenteeism to the economy, we use a multi-factor productivity approach and allow for adjustments of the complementary input factors (capital stock in the economy) to lower labour productivity levels which add on to the direct effects of lower labour productivity.

5.1 Direct Impacts

As mentioned before, the direct impacts of presenteeism are the direct costs faced by employers due to the on-the-job productivity losses caused by presenteeism. Illness affects both the quantity of work (e.g. people might work more slowly than usual or have to repeat tasks) and the quality (e.g. they might make more mistakes) of work that can be done by employees. The lower labour productivity of employees affected by illness translates into increased costs or forgone earnings for employers.

The direct costs of presenteeism to Australian employers are estimated to be around 1.9 per cent of GDP (equivalent to about \$17.6 billion of real GDP in 2005/06, 2004-05 prices). This is estimated by multiplying the overall labour productivity loss due to presenteeism calculated in Section 4.3 (2.54 per cent) times the labour share of the economy (0.75). In comparison, international studies²¹ found the direct costs of presenteeism in the US to be approximately 1.7 per cent and 2.5 per cent of the US GDP.

5.2 Economy Wide Impacts- National Effects

This section provides estimates of the average annual economy-wide costs of presenteeism in Australia. As mentioned before, this involves modelling two alternative scenarios, the No Presenteeism Scenario and the Baseline Scenario. The difference in economic outcomes between these two scenarios determines the economic costs of presenteeism.

As mentioned in previous section, presenteeism causes direct labour productivity losses to employers. These direct impacts then filter through the economy, causing changes to capital investment and other impacts to upstream and downstream industries. These other impacts

²¹ Gotzel. et al. (2004) and Stewart et al. (2003a)

are called the indirect impacts of presenteeism.

To fully capture the direct and indirect effects presenteeism, Econtech has used its MM2 model of the Australian economy. MM2 is a fully integrated macro-industry econometric model which can be used to fully capture both the direct and indirect impacts of presenteeism on the Australian economy.

Chart 5.1 shows the national macro-economic effects of presenteeism. Specifically, the chart shows that on average, presenteeism decreases GDP by 2.79 per cent. That is, the labour productivity losses caused by presenteeism lead to a long-term decrease in GDP of 2.79 per cent, when compared to the No Presenteeism Scenario.

Furthermore, Chart 5.1 shows the effects of presenteeism on private consumption. The chart shows that private consumption is 3.3 per cent lower under the Baseline Scenario (where presenteeism continues to exist as its current rate) than under the No Presenteeism Scenario. The disproportionately high reduction of private consumption stems of a higher responsiveness of private consumption than public consumption to labour productivity losses due to presenteeism.²²

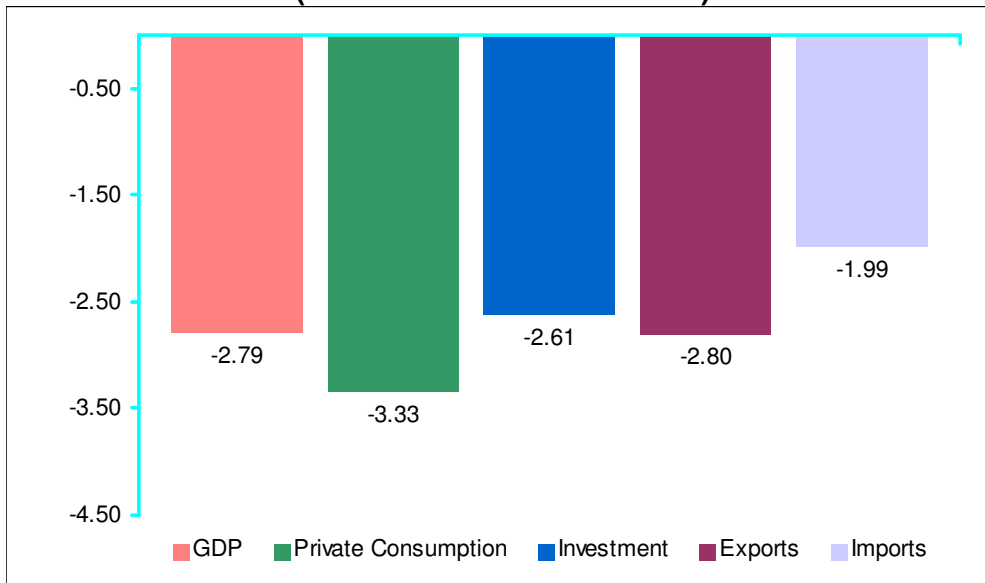
Private consumption represents household spending on all goods and services. In Australia, private consumption accounts for 76 per cent of total consumption. Traditionally, when analysing the impacts of a policy change or a phenomenon such as presenteeism on the economy, the focus has been on using GDP to measure the impact on living standards. However, it has long been the standard practice of Econtech to use private consumption as the measure of living standards instead of GDP. This is a better measure because living standards derive from private consumption, not GDP. So, in principle, private consumption is a more appropriate measure of changes in living standards than GDP. Therefore, the best single measure of the impact of presenteeism on living standards is private consumption.

The negative impact of labour productivity losses stemming from presenteeism flow throughout the economy, leading to a general reduction in the level of exports, imports and investment (*all other things being equal*). Indeed, Chart 5.1 shows that, when compared to the No Presenteeism Scenario, exports are lower by 2.8 per cent and imports are lower by 1.99 per cent.

Chart 5.1 also shows the effects of presenteeism on investment. The chart shows that investment is 2.61 per cent lower under the Baseline Scenario, than under the No Presenteeism Scenario. It also illustrates the effects on the Australian trade balance which decreases due to the fact that the decrease in exports is relatively higher than the decrease in imports.

²² The overall reduction of consumption, private and public is supposedly equal to the percentage loss of labour productivity, equalling approximately 2.5 per cent.

Chart 5.1
National Macro-economic Effects of Presenteeism
 (% deviation from baseline)

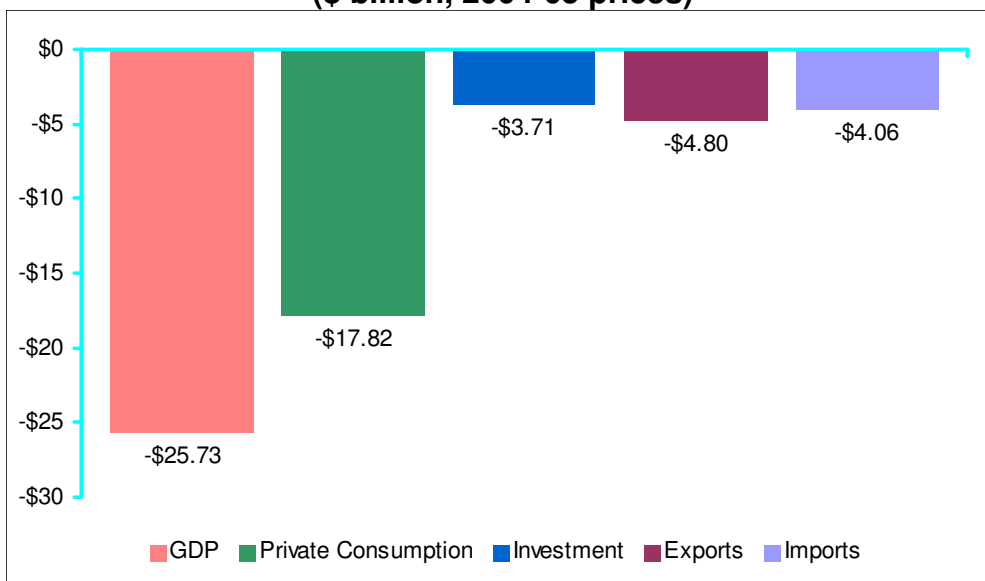


Source: MM2, Econtech

Chart 5.2 provides a summary of the economic impacts of presenteeism in dollar terms for the financial year 2005-06. As shown in the chart, in 2005-06, presenteeism caused GDP to be around \$25.7 billion lower than if presenteeism did not exist. Furthermore, Chart 5.2 shows that private consumption in 2005-06 was \$17.8 billion lower due to labour productivity losses caused by presenteeism.

Additionally, Chart 5.2 shows that in the financial year 2005-06, presenteeism lowered investment by \$3.7 billion, exports by \$4.8 billion and imports by \$4.06 billion.

Chart 5.2
Economic Impacts of Presenteeism in 2005-06
 (\$ billion, 2004-05 prices)



Source: MM2, Econtech

5.3 Economy Wide Impacts- Industry Effects

This section shows the average annual cost of presenteeism at the industry level in the long run. The average annual industry production effects are shown in Chart 5.3. The industry production effects shown in this chart reflect the reduction in production that is attributable to labour productivity losses stemming from presenteeism.

Chart 5.3 shows that, while all the industries lose, the biggest percentage losses are concentrated in the culture and recreation services industry, the manufacturing industry, the electricity, gas and water industry and the transport industry.

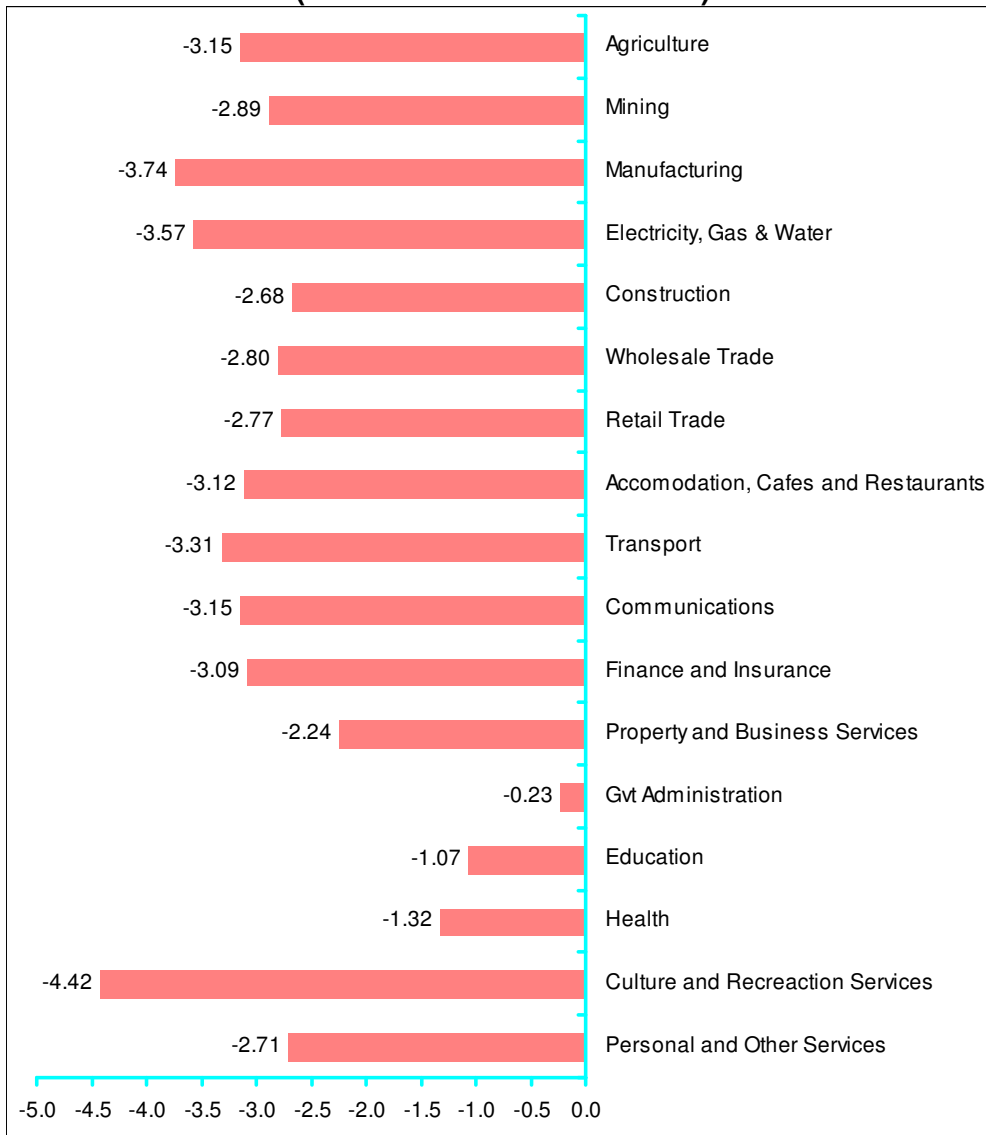
As shown in Chart 5.3, the industries that show the biggest production impacts are the culture and recreation services, manufacturing and electricity, gas and water industries. The culture and recreation services industry shows a decrease in production of about 4.42 per cent when compared to the No Presenteeism Scenario. This effect is mainly caused by the high responsiveness of these sectors to a decrease of private consumption which is an important demand factor for the industries. In contrast to the above mentioned industries, the industries which depend to a larger degree on public consumption, like the government administration, education and health industries are to a lower degree affected by the presenteeism productivity shock.²³

The manufacturing industry also shows significant production effects. Under the Baseline Scenario (where presenteeism continues to occur at the current rate), production in this sector is 3.74 per cent lower than under the No Presenteeism Scenario. That is, on-the-job labour productivity losses caused by presenteeism lower the annual production in this industry by 3.74 per cent.

Finally, the electricity, gas and water industry shows a 3.57 per cent decrease in production when compared to the No Presenteeism Scenario. As with the other industries, the production effect in this industry is fuelled by the losses in labour productivity due to presenteeism and the disproportionate decrease of private consumption that constitute an important demand factor for this industry.

²³ The MM2 model assumes that public consumption has a lower responsiveness to productivity shocks which leads to the lower production losses in the government administration, education health industries.

Chart 5.3
Impact of Presenteeism on Industry Production
(% deviation from baseline)



Source: MM2, Econtech

6. Implications for Business

Health conditions reduce workplace productivity, creating a substantial economic burden for companies and the economy as a whole. Indeed, the results presented in the previous section showed that productivity losses due to presenteeism generally lower GDP, private consumption, investment, exports, imports and industry production.

Traditionally, the costs of presenteeism have been ‘invisible’ to employers. Indeed, most management attention to date had focused on direct health care costs and absenteeism. Nonetheless, as discussed in previous sections of the report, evidence shows that health conditions are common among all job types and have the potential to significantly impact a company’s financial performance.

Interestingly, presenteeism also represents a substantial opportunity for business managers to improve their company’s performance by supporting and investing in measures that improve functioning for individuals with health conditions.

For instance, assuming that the gross-wage sum accounts for 30 per cent of a company’s turnover and that the company’s presenteeism costs correspond to approximately 3 per cent of the gross-wage sum, a reduction of presenteeism by half would decrease the labour costs from 30 per cent to 29.55 per cent.²⁴ This reduction of the wage costs to an employer would correspond to an increase of its profit margin from five per cent to 5.45 per cent in terms of a company’s turnover if the costs savings translate directly into profits. The company profit would rise as result of this reduction by nine percent compared to its previous level.²⁵ This simple example illustrates the business case of reducing presenteeism for companies.

Hemp (2004) identified some steps that companies can take to address presenteeism and improve their employee’s productivity. These steps are as follows.

- *Awareness.* Hemp (2004) suggests that the first step to address presenteeism is to be aware of the problem. In this respect, this Econtech study plays a key role by providing information of the economic impact of health conditions on business and on the Australian society.
- *Identification of employee’s health status.* This step involves getting to know the particular health issues affecting the employees. By identifying the health conditions affecting its employees, a company can design better programs to improve their health.
- *Education.* In his 2004 article, Hemp highlights the importance of educating employees to ensure that illnesses are not going undiagnosed because employees do not realize they have a problem or that illnesses are not being misdiagnosed. Furthermore, Hemp highlights the importance of teaching employees how to better

²⁴ The reduction of the labour costs of a company to 29.55 per cent from 30 per cent is derived by first multiplying the gross wage sum (30 per cent) times the assumed presenteeism costs to the employer (3 per cent of 30 per cent, which equals 0.9 per cent of the total turnover). After calculating the total costs of presenteeism, the costs of a 50 per cent reduction of presenteeism is derived by multiplying the total costs of presenteeism to the employer (0.9 per cent) with 0.5 which equals 0.45 per cent of the total turnover of a company.

²⁵ This hypothetical example is provided for illustrative purposes only. The figures do not represent any particular Australian company, nor do they reflect the actual gains of reducing presenteeism accruing to any company.

manage their illnesses (e.g. changing their diets, take their medications regularly, exercising, etc).

In the same article, Hemp (2004) also suggests other strategies that a company could implement to address the problem of presenteeism. These strategies are:

- health risk assessments to gather information from employees on conditions that may cause future health problems;
- employee assistance programs which offer counselling services for employees and their families; and
- wellness programs which foster healthy practices such as a balanced diet and exercising.

The key idea behind these strategies is that “better management of employee health can lead to improved productivity, which can create a competitive business advantage” (Hemp, 2004, pp. 58²⁶).

²⁶ Quote by Sean Sullivan, Institute for Health and Productivity Management.

7. Conclusion

This study estimates the cost to the Australian economy of productivity losses due to presenteeism in the workplace. Importantly, this report can inform policymakers, businesses and health insurers about the magnitude of the problem of presenteeism by providing estimates of the economic impact of health conditions on business and on the Australian society.

The results presented in this report demonstrate that presenteeism has substantial impacts on productivity and imposes an important economic burden to businesses and to the Australian economy as a whole.

Furthermore, the evidence presented in this report indicates that investments in interventions that improve functioning for individuals with health conditions can have large payoffs in terms of productivity improvement. Therefore, it is important that businesses identify cost-effective measures that can be taken to recover some, if not all, of the on-the-job productivity lost to employee medical conditions.

Importantly, investing in employee health can create a win-win situation for employers and employees alike. Employees can enjoy better health and improved quality of life while companies realize more productive employees.

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Attachment A – Murphy Model 2 (MM2)

Econtech's forecasting tool, Murphy Model 2 (MM2), is Australia's leading national, industry and state forecasting model. It has a highly respected forecasting track record and is used by Federal and State Governments, industry associations, financial institutions and major companies. Subscriptions to forecasting reports and Windows-based forecasting software are available.

Development

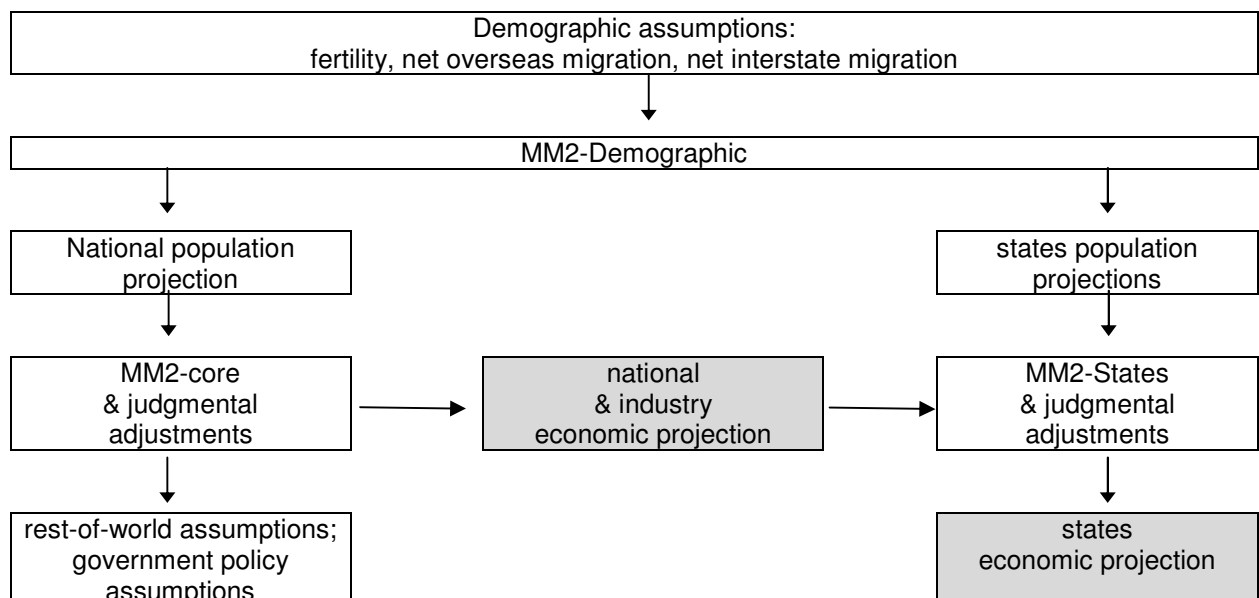
The original Murphy Model was developed by Chris Murphy, after ten years of experience in macroeconomic modelling at the Australian Treasury, Economic Planning Advisory Council, and the Australian National University. In 1988, Chris published the first version of the Murphy Model in Australian Economic Papers, and it was soon recognised as Australia's leading national or macro model.

In 1994, the first major redevelopment of the model was undertaken to distinguish 12 industry sectors. This marked the introduction of the Murphy Model 2 (MM2), a fully integrated macro and industry model.

In 1995, under contract to two state treasuries, the MM2-States was developed as an extension to MM2. The MM2-States allocates a number of MM2's key outputs across the eight Australian States and Territories.

In the same year, the current version of MM2-Demographic was developed under contract to the Australian Bureau of Immigration Research. Using assumptions for fertility, mortality, overseas and interstate migration, it generates consistent state and national population scenarios.

In 1996, the MM2 was further developed to expand the sectoral detail from 12 sectors to the 18 sectors corresponding to the Australian and New Zealand Standard Industrial Classification (ANZSIC) industry divisions. The linkages between the three models are illustrated below.



Features

MM2 is a state-of-the-art, fully-integrated macro-industry model with the following features:

- produces quarter-by-quarter nine-year-ahead forecasts;
- forward-looking financial sector for realism;
- Keynesian short-run for forecasting; and
- neoclassical long-run for policy analysis.

Documentation

Powell, A.A. and Murphy, C.W. (1997), *Inside a Modern Macroeconometric Model - A Guide to the Murphy Model*, Springer, Berlin, 2nd ed., 455pp.

MM2 Forecasting Services

The MM2 suite of models is used every quarter to produce comprehensive and up-to-date economic forecasts at the national, industry and state levels.

The national, industry and state forecasts are available in a group of forecasting reports. By also subscribing to the MM2 forecasting software service, clients can easily vary any of Econtech's assumptions to produce their own forecasts and alternative scenarios.

Consulting

As well as forecasting services, MM2 has also been used in several consulting projects as follows.

- "Economic Effects of the Recent Tourism-Related Events on the Tourism Sector and the Economy", prepared for the Department of Industry, Tourism and Resources (2001)
- "The Economic Impact of Changes in the Migration Program between 1995-96 and 1997-98", prepared for the Department of Immigration and Multicultural Affairs (1998).
- "The Economic Impact of 2000/01 Migration Program Changes", prepared for the Department of Immigration and Multicultural Affairs (2001).