AVACO AG

Working Paper II/2013

Swiss Real Estate Market – Is Soft Landing an Option?

Fabian Kostadinov, fk@avaco.ch
Thomas Ankenbrand, ta@avaco.ch

Abstract

Given a decade of increasing real estate prices in Switzerland, the question arises as to how high the probability of a soft landing for real estate prices is. In an attempt to address this question, we take a closer look at different studies comparing the characteristics of past cycles in the real estate markets of different countries. We find that, as real estate markets tend to be subject to cyclical behavior, an up or down movement of prices is much more likely to occur than a sideways movement. Therefore, real estate prices in general have a much higher probability to rise or to fall than to move sideways. Furthermore, the upward and downward price phase of real estate cycles tend to be symmetric concerning their duration and slope. From these insights we conclude that if the past long-term trend of increasing prices in the Swiss real estate market stops, a hard landing must be expected. That is, a long-term decline of real estate prices is the most probable scenario once the tipping point has been reached.

Introduction

AVACO has developed an agent-based model of the Swiss real estate market (Kostadinov, 2013). In agent-based market models, the behavior of the individual market participants on the micro-level is aggregated and the resulting model's macro-level behavior of the market as a whole can be measured as a complex, emergent pattern[1]. The scenario analyses conducted with the model show that the Swiss real estate market is currently in a rather weak condition. In the absence of strong, positive market forces, the modeled Swiss real estate market is inclined towards a negative correction. Only in the presence of positive market forces can a further increase of market prices be observed.

The question now arises whether after roughly a decade of increasing prices a new plateau will be reached and the current development will smoothly convert into a sideways movement (soft landing), or whether the past increases will at one point be followed by a corresponding decrease (hard landing or crash scenario). To answer this question this paper gives an overview of the characteristics of past real estate cycles.

---

[1] For more information on AVACO's agent-based model of the Swiss real estate market visit http://www.avaco.ch or send an email to info@avaco.ch.

Past real estate cycles

Figure 1 shows the historical house price developments of multiple countries in the years 1971-2007. The figure was originally published in a study authored by Agnello and Schuknecht (2009) and shows preprocessed[2] and detrended house price data the authors had obtained from the Bank for International Settlements (BIS). The authors were interested in the identification of boom and bust periods, and they applied an algorithm to identify such periods.

Our approach is somewhat different. There are three main defining characteristics of cycles: duration, amplitude and slope (Claessens et al., 2011). We want to investigate visually into these characteristics, i.e. we want to know how the upward phase correlates with the downward phase of real estate cycles. For this purpose we have modified the original figures as published by Agnello and Schuknecht (2009), omitting certain graphical elements depicting boom and bust periods originally included. At the same time we inserted red bars to highlight the duration and amplitude of cycles and also blue dashed lines to highlight cycles that were still ongoing at the end of the charts. The absence of a blue dashed line at the right side of a chart indicates that as yet no cycle peak has been observed (Switzerland, Germany).

What is striking is the cyclical nature of real estate markets depicted in figure 1. As one can see, nearly all of these markets have a tendency to either long-term upward or downward price movements. Prolonged side movements are clearly in the minority. Furthermore, there obviously is a strong correlation between the upward and the downward phase of a cycle. The vertical (red) bar in most cases cuts the horizontal (red) bar at its mid-point, i.e. in most cases the detrended prices fall back to the level they were at the beginning of the cycle. This is the same as stating that the downward slope is roughly the mirrored version of the upward slope. These or similar findings are also supported by other studies (Bracke, 2011; André, 2010; Roehner, 2006).

As the charts end in 2007, it is interesting to take a look into the further development for the years from 2007 to 2013. We wanted to know whether in any of the charts in figure 1, where prices had increased prior to the year 2007, a soft landing could be observed in the following years. For this purpose we applied the same procedure as Agnello and Schuknecht, i.e. we took the available but augmented BIS dataset (BIS 2013) and followed their data detrending procedure steps. Figure 2 shows the results[3]. Germany and Japan did not show any significant price increases prior to 2007; hence these countries are omitted.

---

[2] The exact details of the pre-processing steps and the identification algorithm for booms and busts can be found in their study. The pre-processing involved amongst others the application of a Hodrick-Prescott-filter on the logarithmized data for detrending. They then identified peaks as housing price growth patterns of $\{\Delta x_t > 0, \Delta x_{t+1} < 0\}$ and troughs as patterns of $\{\Delta x_t < 0, \Delta x_{t+1} > 0\}$. Some of the data the authors used can be obtained from the BIS website: http://www.bis.org/statistics/pp.htm.

[3] Caused by the deferred time frame in combination with the mathematical details of the detrending procedure the charts in figure 2 might not perfectly fit the continued curves in figure 1.
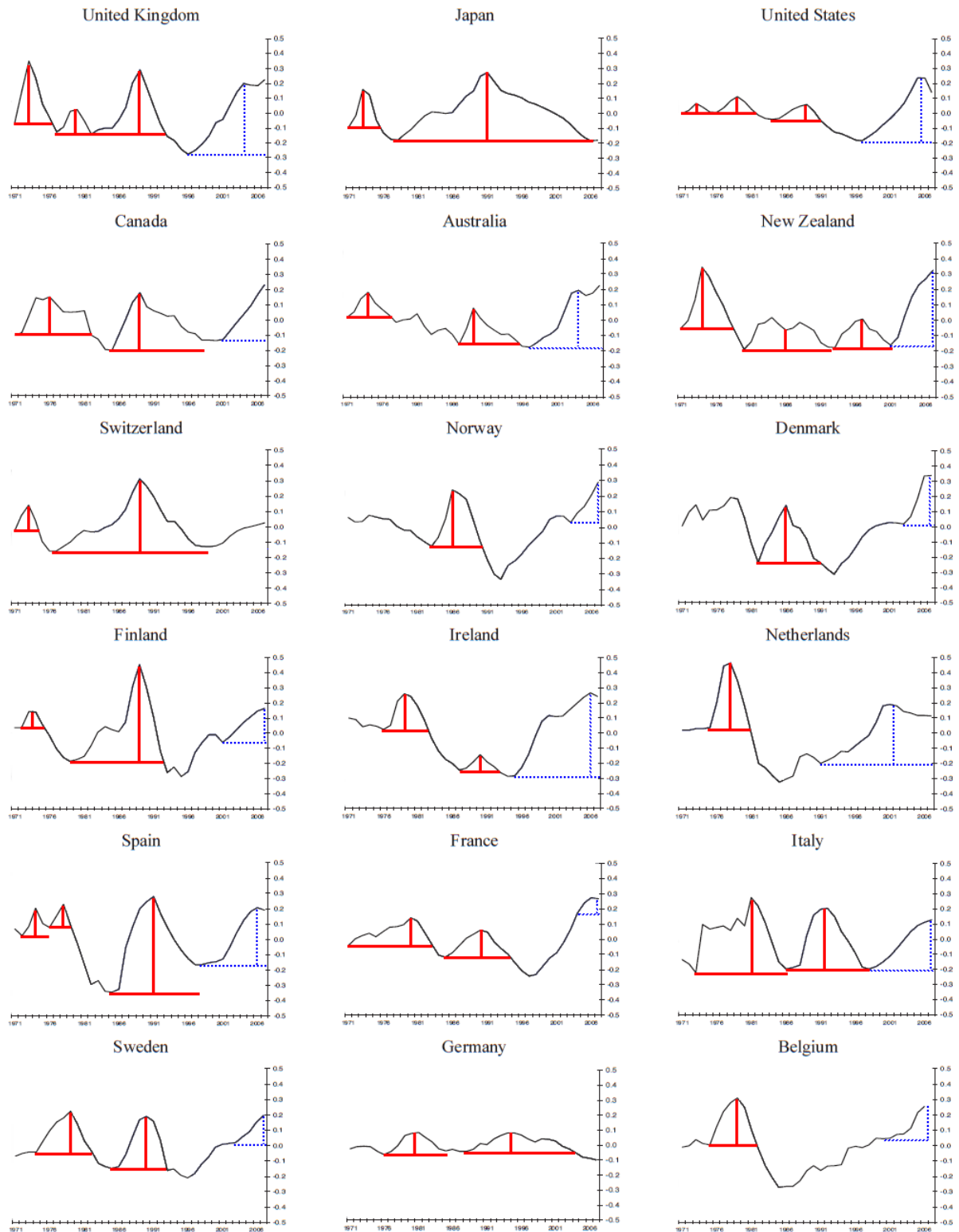
Figure 1 Detrended housing prices calculated by Agnello and Schuknecht (2009) for various countries in 1971-2007. The original figure additionally contains periods identified by them as booms and busts, which we omitted for clarity. Red and blue lines have been added by us. In red: Characteristics of past real estate cycles. In blue: Characteristics of real estate cycles that have not ended in 2007. Source: Agnello and Schuknecht (2009), original figure title: *Housing prices gaps and Boom and Bust Phases. Period: 1971-2007.*

In figure 2 all of the observed countries – with the notable exception of Switzerland, which will be discussed in the next section – experienced decreasing real estate prices in the years after 2007. In Australia, the prices zigzagged a little longer until in 2010 they plunged till 2013. In Canada the price decreases do not appear as pointed as for the other countries, and the future will show whether prices fall back to an even lower level or not. For Finland, Ireland and France there was not enough data from BIS in order to produce a chart. However, according to different sources (Delmendo 2013; IPD 2012) these three countries also experienced price drops in those years. In cases like Norway and Sweden, one or two shorter cycles seem to overlap a longer one (ca. 1996 to 2009).
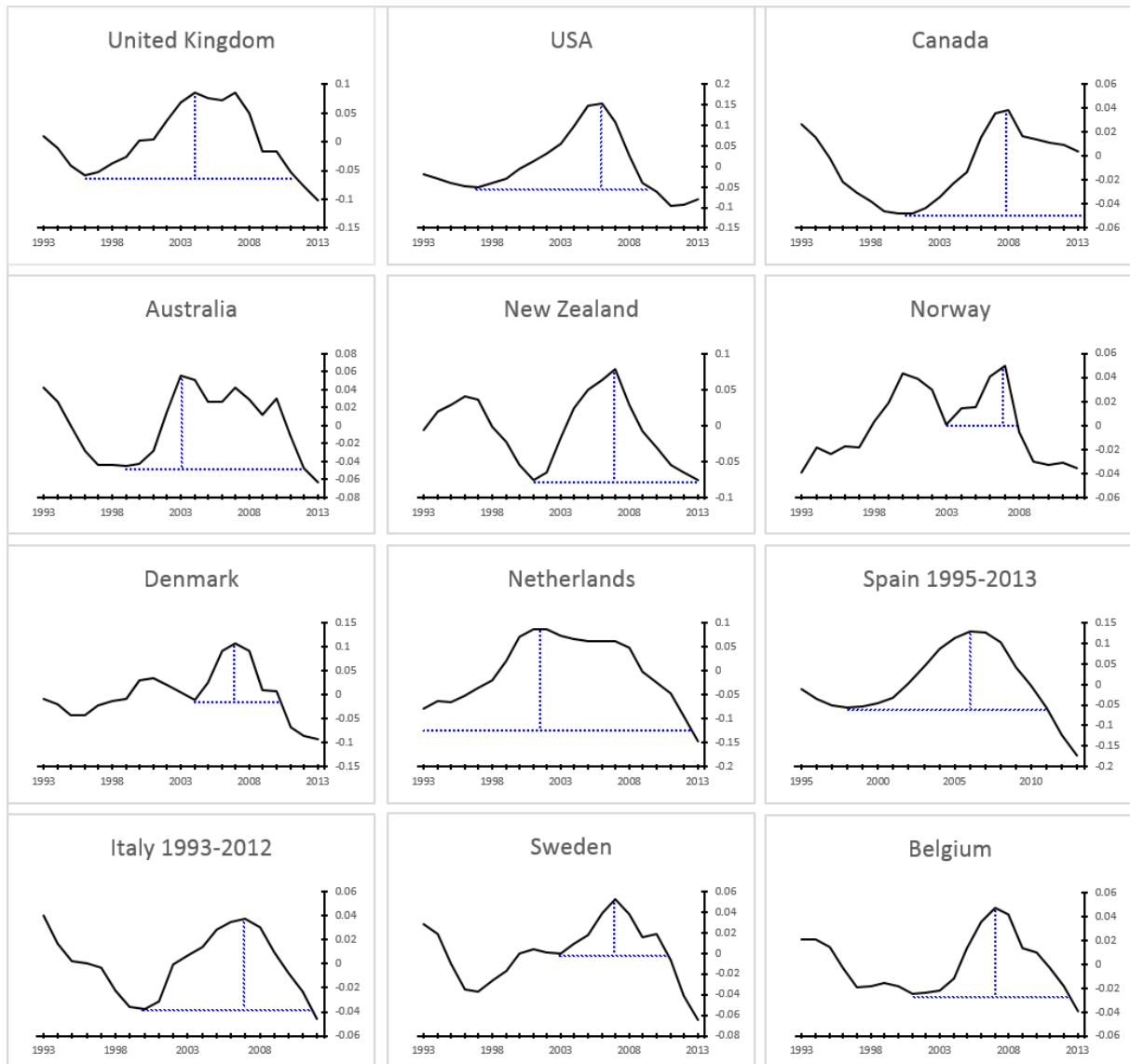

Figure 2 Detrended housing prices for various countries in the years 1993-2013 (unless stated otherwise)

The conclusions from above still hold true. First, prolonged side movements are clearly in the minority, real estate prices tend to either move upwards or downwards. Second, there is a strong correlation between the upward and the downward phase of a cycle.

AVACO AG

Agnello and Schuknecht (2009) also investigate quantitatively into the characteristics of cycles they explicitly identify as bubbles. Table 1 is an excerpt of a more complete table found in their study[4]. It gives an overview of ten different bubbles concerning on the one hand the durations of the upward and downward phases (column "Persistence") and on the other hand their magnitudes, measured as a relation between house prices at their peak and their trough[5]. For instance, the Swiss real estate boom in the years 1983-1989 persisted seven years and had a magnitude measure of 34.70. The boom phase was followed by a bust phase in the years 1990-1999 lasting for 10 years and having a (negative) magnitude of -44.17.

Country[6]		Years	Persistence	Magnitude
United Kingdom	Boom	1983-1989	7	43.31
	Bust	1990-1996	7	-56.58
Japan I	Boom	1986-1991	6	27.42
	Bust	1992-2006	15	-45.47
Japan II	Boom	1979-1991	13	45.19
	Bust	1992-2006	15	-45.47
Switzerland	Boom	1983-1989	7	34.70
	Bust	1990-1999	10	-44.17
Denmark	Boom	1983-1986	4	37.58
	Bust	1987-1993	7	-45.42
Finland	Boom	1987-1989	3	44.41
	Bust	1990-1993	4	-71.45
Netherlands	Boom	1971-1978	8	47.10
	Bust	1979-1985	7	-78.95
Italy	Boom	1987-1992	6	40.12
	Bust	1993-1998	6	-40.36
Spain	Boom	1986-1991	6	62.55
	Bust	1992-1998	7	-44.64
Sweden	Boom	1986-1990	5	29.87
	Bust	1991-1993	3	-35.61
Averages	Boom		5.8	40.79
	Bust		7.3	-51.55
	Difference		1.5	-10.65

Table 1 Boom-bust phases in industrialized countries over the period 1970-2007 according to Agnello and Schuknecht (2009)

The table illustrates that there exists a strong positive correlation between both the persistence of the upward and downward phase of a bubble as well as a strong negative correlation between their magnitudes. As the authors put it

---

[4] See Agnello and Schuknecht (2009): *Table 2: Boom-bust phases in industrialized countries over the period 1970-2007* in section 3.3. For brevity some additional data have been omitted. The full table further contains measures for short-term interest rates and real credit growth over the boom and bust phases.

[5] The given value of the magnitude is not a percentage value, however the measure can be compared among countries and between booms and busts. See Agnello and Schuknecht (2009) for a more precise definition.

[6] For Japan two different possible ways of identifying a real estate bubble are given by the authors denoted as Japan I and II.

"[…] long and severe booms tend to be followed by long and severe busts. […] Moreover, bust episodes mostly tend to be equally long or slightly longer and of an equal or higher magnitude than boom episodes." (Agnello and Schuknecht, 2009; section 3.3)

It is important to note that the durations can be as short as three years for the boom and four years for the bust phase in the case of Finland, or as long as thirteen years for the boom and fifteen years for the bust phase in the case of Japan (ibid; table 2). The authors suggest to call Switzerland a "long cycler" together with some other countries due to their relatively long duration of real estate cycles.

Of interest is also another study authored by Roehner (2006). The author takes a look at several historical real estate cycles in different places in the USA and also in other countries. Compared to the last authors, he does not explicitly refer to bubbles but more generally talks of real estate price peaks. He comes to similar conclusions as the former authors:

"Roughly speaking price peaks are almost symmetrical with respect to their maximum, which means that the rising and falling phases have approximately the same duration." (Roehner 2006; section 2)

This is valid for real estate price peaks in different countries at different times, even reaching back to the 19th century. In the Abstract section of the same article, the author states it even more pointedly:

"Historically, price peaks turned out to be symmetrical with respect to the peak; soft landing, i.e., an upgoing phase followed by a plateau, has rarely (if ever) been observed." (Roehner 2006; Abstract)

The case of Switzerland

Unlike the other countries shown in figure 2, in Switzerland real estate prices continued to rise also in the years 2007 to 2013. Figure 3 depicts the SWX IAZI Investment Real Estate Price Index (IAZI 2013a; SI Investment PR; blue line) and the SWX IAZI Private Real Estate Price Index (IAZI 2013b; SI Private PR; orange line) in the years 1987 to 2013 Q3. Given the finding that in real estate cycles the downturn phase mirrors the preceding upturn phase, and assuming that the cycle's tipping point was reached today, then both indices can be projected into the future. This is indicated by the dashed lines in figure 3.
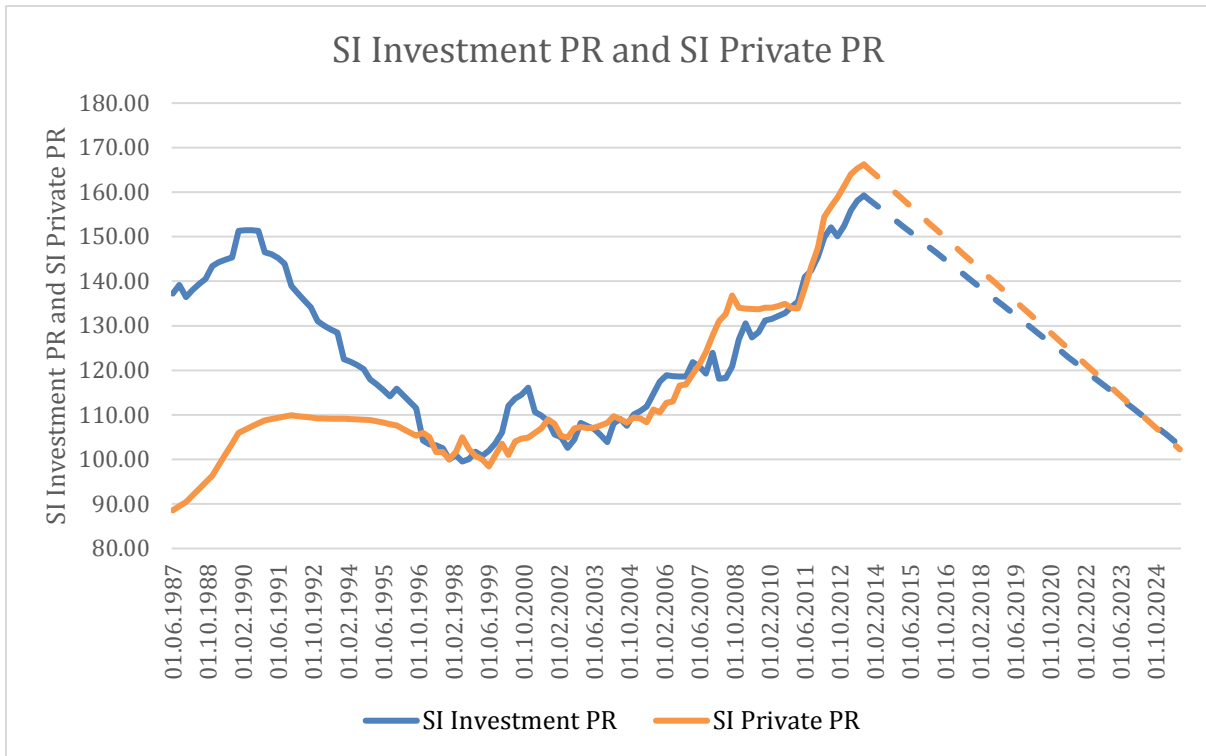
Figure 3 SI Investment PR index (blue) and SI Private PR Index (orange). The dashed lines projects the indices onto the future, given that the cycle's tipping point was reached today.

These projections actually correspond well with the simulation results provided by our agent-based model of the Swiss real estate market. Figure 4 shows simulation results in a scenario of rising interest rates.
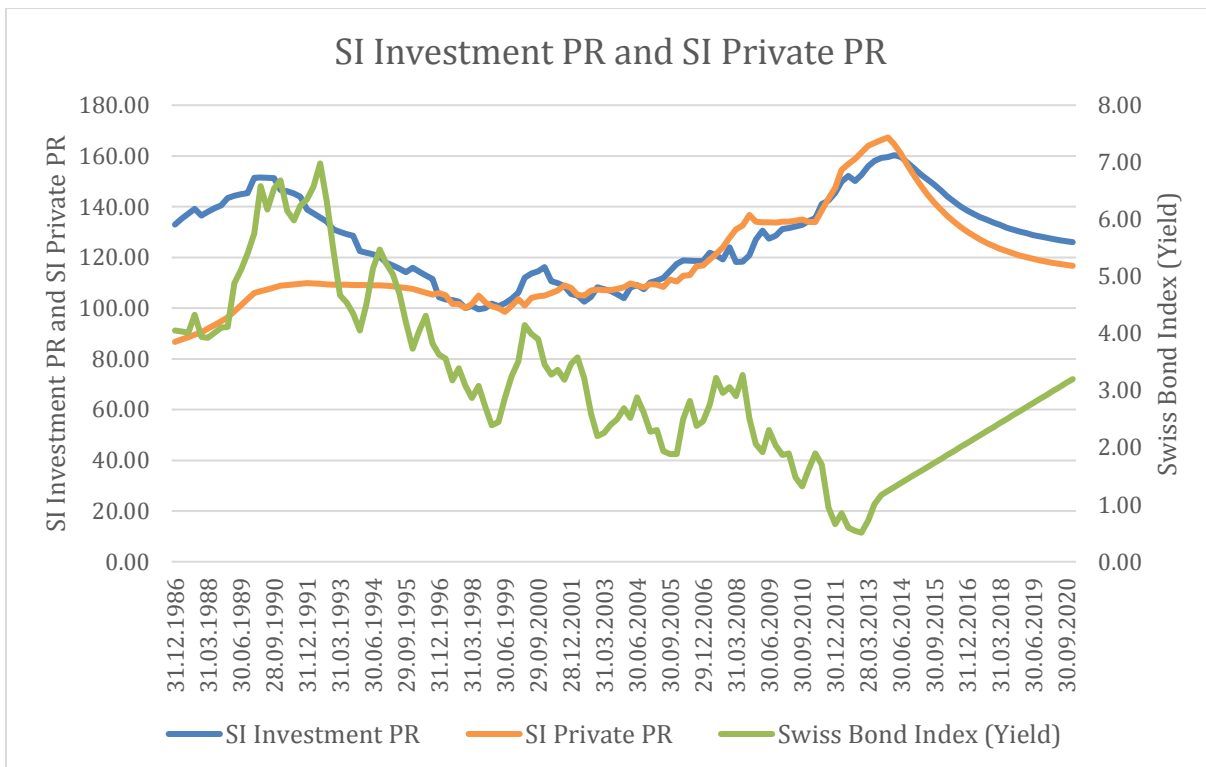

Figure 4 Simulation results obtained through AVACO's agent-based model of the Swiss real estate market in a situation of increasing interest rates.

AVACO AG

Starting from 2013 Q3 both indices are generated as a simulation output, whereas the interest rates (expressed as the yields of the Swiss Bond Index) are continually increased. In our model, rising interest rates lead to a long-term negative correction of both indices (full lines). As predicted by the cycle theory, the decline of both indices quite closely mirrors the preceding price increases.

As we have argued above, prices will either continue to rise or otherwise they will fall, but a prolonged sideways movement is not very probable.

Conclusions

We are now prepared to come back to our original main question: Is soft landing an option in the Swiss real estate market? We believe that a soft landing is an improbable event due to the reasons stated above.

First, real estate markets tend to move in cycles. That is, they tend to be in an upward or a downward phase. Prolonged sideways movements of real estate prices are a rather uncommon phenomenon and in fact occur rarely.

Second, looking back at Switzerland's real estate price development of the last decade, it can be seen that prices were in a long-term upward trend ever since 2000. As was shown, real estate cycles tend to be highly symmetric concerning the characteristics – duration, amplitude, slope – of both the upward and downward phase. Therefore, once the tipping point has been reached a corresponding negative correction (hard landing) must be expected, which would mean a long-term decline of real estate prices mirroring more or less the preceding upward phase.

AVACO is a start-up company with an experienced staff and a proven track record in modeling of markets. Our target is to understand markets better in order to make sure that our customers can improve and optimize their risk/return exposure. Our models are used for risk management and asset management.

References

Agnello L., Schuknecht L. (2009): Booms and Busts in Housing Markets – Determinants and Implications. Working Paper published by the European Central Bank. No. 1071. http://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1071.pdf (Last accessed Aug. 2013)

André C. (2010): A Bird's Eye View of OECD Housing Markets. OECD Economics Department Working Papers. OECD Publishing. No. 746. http://www.oecd-ilibrary.org/economics/a-bird-s-eye-view-of-oecd-housing-markets_5kmlh5qvz1s4-en (Last accessed Aug. 2013)

BIS (2013): Property Price Statistics. Bank for International Settlements (BIS). http://www.bis.org/statistics/pp.htm (Last accessed Sept. 2013)

Bracke P. (2011): How Long Do Housing Cycles Last? Duration Analysis for 19 OECD Countries. Working paper published by the International Monetary Fund

(IMF). Vol. 11, No. 231. http://www.imf.org/external/pubs/ft/wp/2011/wp11231.pdf (Last accessed Sept. 2013)

Claessens S., Ayhan Kose M., Terrones M. E. (2011): Financial Cycles: What? How? When? Working paper published by the International Monetary Fund (IMF). No. 1176. http://www.imf.org/external/pubs/ft/wp/2011/wp1176.pdf (last accessed Sept. 2013)

Comparis & ETH Zürich (2013): Schweizer Immobilienmarkt kühlt sich ab – Immobilien-Report der ETH Zürich und comparis.ch. Online article available at http://www.comparis.ch/comparis/press/medienmitteilungen/artikel/2013/immobilien/immobilien-report-08-2013/immobilien-markt.aspx (last accessed Sept. 2013)

Delmendo L. C. (2013): Finland's modest house price rises. Global Property Guide. Online article available at http://www.globalpropertyguide.com/Europe/Finland/Price-History (Last accessed Sept. 2013).

IAZI (2013a): SWX IAZI Investment Real Estate Price Index. Data obtained from IAZI CIFI. http://www.iazicifi.ch/de/transaktionsindizes.php

IAZI (2013b): SWX IAZI Private Real Estate Price Index. Data obtained from IAZI CIFI. http://www.iazicifi.ch/de/transaktionsindizes.php

IPD (2012): IPD Quarterly Property Price Indicators. Retrieved from http://www.ipd.com/LinkClick.aspx?fileticket=lKBHcN7GEHY%3D&tabid=3912 (Last accessed Sept. 2013)

Kostadinov F. (2013): An agent-based model of a Swiss real estate market. European Social Simulation Association (ESSA) conference in Warsaw. http://www.avaco.ch/images/downloads/pdf/2013/Kostadinov_2013_An_Agent_Based_Model_of_a_Swiss_Real_Estate_Market.pdf

Roehner B. M. (2006): Real Estate Price Peaks – A Comparative Overview. Evolutionary and Institutional Economics Review. http://www.lpthe.jussieu.fr/~roehner/eier06b.pdf (Last accessed Aug. 2013)